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GAS JOURNAL

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[Founded in 1849 as the "Journal of Gas Lighting."]

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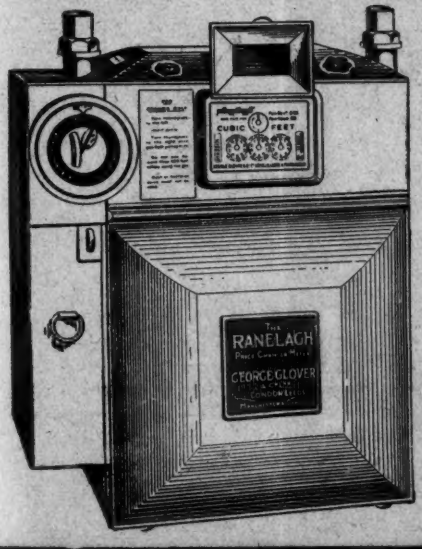

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EDITORIAL NOTES.

Low-Temperature Carbonization in Vertical Retorts.

As a contribution to the knowledge of the carbonization of coal at low temperatures, there is not very much of technical value attaching to the Fuel Research Board Technical Paper No. 7, which deals with preliminary experiments in coal carbonization at low temperatures in vertical retorts. The retorts used were the Glover-West ones at the Fuel Research Station, which are designed solely for high-temperature carbonization. Therefore, the plant is ill-adapted for low-temperature work; and we shall be somewhat curious to ascertain the nature of the design of retorts which experience of the use at low temperatures of the high-temperature setting has evolved. The value of the report would have been considerably enhanced if the veil had been lifted, and information given upon this point. The new retorts have been erected; but apparently we must await a description of them until the results of their working are available. Obviously, this preliminary investigation was one to determine not maximum results in production or thermally, but the points of unsuitability of the high-temperature plant for low-temperature operation, and was an effort to correct them in designing a new plant for the latter. But we can only regard the admission of steam at these low temperatures in the high-temperature retorts as a fundamental mistake, and one which affords little or no data offering any real guidance for the purpose in view. We may be shown that we are wrong in this; but there is so much obscurity as to the changes in design hat have issued from the tests that it is difficult to say anything positive regarding the value of the results.

However, at the Fuel Research Station there has been working with low-temperature horizontal retorts in which divisioned trays were placed containing charges of coal, and cakes of low-temperature coke were produced. The conclusions drawn from this method of operation were that, while the coke had all the qualities desired as a smokeless fuel, commercially the process could not be a success, and that labour charges would have to be considerably reduced. Then attention was directed to mechanical operation; and a plant was designed, and was seen by many visitors to the station. But we have heard very little as to what were the working successes or otherwise of this plant, and whether any superior economic advantages were obtained. Now attention is being directed to this vertical-retort working, also with a view to securing economic improvements. Ever since low-temperature carbonization returned, and appealed for consideration for the making of a solid smokeless fuel, vertical retorts have been employed —first of small diameter, and then of larger with (for example) vertical divisions for procuring a more cohesive coke —one which would stand transport—than had previously been realized. There was always the difficulty that labour and expenditure generally in relation to product and the vagaries of the oil market (to say nothing of the fragility of the coke for transport purposes), rendered the commercial results extremely shadowy. If that was so at the then prevailing market values of products, how much more would it be so now?

At the Fuel Research Station the objective is still the production of a solid smokeless fuel. But if the lessons of the past and the present position of the oil market have any value, it is that the low-temperature advocates must go beyond solid smokeless fuel, and try to effect a compromise that will give them two stable markets, by looking to the production of the maximum therms in gas combined with the production of a suitable solid domestic smokeless fuel, and regard the remainder and more uncertain of the products as secondary to these two; seeking simultaneously the utmost possible economy in the process itself. In our opinion, the old ways of low-temperature operation have proved the ineffectiveness of continuing to work along them; and those who search for value from such operation must get on to new lines—in some such manner (for instance) as in the Marshall-Easton process—by separate carbonization and separate water-gas making, using the potential and sensible heat of the blow gases for heating-up the chequer brickwork surrounding the retorts, and the sensible heat of the water gas by passing it through the charges in the retorts. There should be in this way fuel economy and productive efficiency by an effective application of heat; and this is not an unimportant consideration. One cannot with externally heated high-temperature large capacity retorts worked at low temperature obtain any reliable data as to the results or fuel economy potentialities comparative with those to be obtained by specially devised plant and operating methods that are conducive to the ends in view. Of course, it may be that the new vertical retorts at the Fuel Research Station are to be worked in a manner that will evidence a striking departure from anything that has been done before. But if smokeless fuel *per se* is to be the objective, then commercially we cannot see that the investigation will add much to our knowledge; if gas and solid smokeless fuel are to be jointly the main products, then experience indicates that at low temperatures sufficient steam cannot be profitably utilized to contribute much to the resultant product, while it must adversely affect the efficiency of the carbonizing process. Therefore it seems to us that the path of progress at present lies largely along internal heating by hot combustible gas, if the low-temperature process is to become part of the equipment of gas undertakings, with the additional responsibility on their part of providing a solid smokeless fuel for the community. But we do not want a process that necessitates the mixing of different coals, as this will only detract from simplicity and economy, unless, of course, the mixing is desirable for the purpose of using cheap low-grade coal. The mixing would have to be done with great care, and uniformly; otherwise there would be disuniformity in the quality of the smokeless fuel. The system must be one with a large range of capacity for individual coals, and not one which limits coal-purchasing power and introduces complications.

The position is so full of interest that we hope the Director of the Fuel Research Station and his staff have struck-out on to new lines that will indeed surpass the work that has hitherto been done, and which has proved itself technically deficient and commercially impracticable.

Truly "Qualified" Directors.

THERE has recently been an interesting correspondence in the "Daily Telegraph," under the heading of the "Duties of Directors." In it not much has been said about the "duties" of these important elements in the system of joint-stock enterprise; but there has been ample written as to the methods of their election to boards and their qualifications, to show that the investing public are awakening to the fact that ornamental directors and those whose static quality

transcends all else are of little or no use to them in making fruitful, or in protecting, their capital. The reason that this matter has again risen to the surface is that latterly many businesses have gone on the rocks—mostly those that were over-weighted with capital during the post-war boom when trade was temporarily plentiful, profits large, and the distribution of dividends seductive. Losses caused by too great a capital loading have not a good effect on any class of joint-stock enterprise. Investors, as a rule—and this was a growing phase following the war, with income-tax and the cost of living high—looked more to big dividends than to the character of the security. They were not altogether discriminating in those times; and many men, through liquidations and reconstructions (and there are more to come), have realized their folly in the disaster that has overtaken them. The blame for these over-capitalizations rests with those who were "directing" the concerns, or rather who should have been doing so; for now it is recognized more than it was before that very often one or two strong men on a board of directors simply lead their fellow-directors as they please.

As we say, these unfortunate happenings have had with investors a bad influence upon joint-stock enterprise generally. If, however, it promotes a change from the apathy of shareholders to an active interest in the personnel of the directorates of the companies in which they are concerned, it will do good. We shall be glad to see this, even if it penetrates into the gas industry. We are not going to say harsh things, though in some cases there is room for it. But there are two lines upon which improvement could be effected in connection with not a few boards of gas directors. The first is in respect of qualification and competence; and the second is in regard to the manner in which members of boards are elected. The direction of a gas undertaking should be the work of a body of specialists judiciously composed. We are not prepared to say that all the members should have technical gas qualification; but it is advisable that one or two of them should have knowledge of the work of gas manufacture, distribution, and utilization. Then men with good commercial, financial, and legal qualifications could make up the necessary number. The knowledge and assistance of such men are of inestimable advantage to the technical members. The constitutions of many gas boards, however, show no attempt at creating and maintaining a balance of essential qualification. That often seems one of the last things to be thought of or taken into account. And the members of the ill-constructed boards are maintained in the position simply and solely because, in one way or another, they have secured the office, and then appear to claim a prescriptive right to it. But we see no reason why directors in any concern, however well regarded on personal grounds, should not be removed by the shareholders if they are not the possessors of the qualification or physical capacity needed for the work. We are talking a great deal in the industry about raising the level of the qualification and competence of the members of staffs and workers. What for? In the interests of the undertakings. If, at the same time, gas shareholders would only see to it—also in the interests of the undertakings—that the administrators, as a body, possess the desired qualifications for their functions, there would be no question as to everything possible being done universally to raise the qualifications and competence of the staffs and workers. It is simply the inability to appreciate essentials that allows things, amid new circumstances, to drift on in old ways.

The shareholders are in one sense to blame for the poor directorial compositions of the past. They have left the selection of members of Boards too much to those who already hold office. The election of directors for vacancies is really a matter for the shareholders, and not for the boards, other than temporarily or as a recommendation. Directors are the representatives of the shareholders; and if their election is not left to the latter, then, in truth, they are not their representatives. There is too much control in this regard by boards, and too much reticence on the part of shareholders to look after their own interests, because they do not like to oppose nominees of the existing members of the board. But this is where the apathy of the shareholders has permitted the constitution of some boards to grow and flourish not on the ground of ability and competence, but on grounds that have no association with one or other of those necessary qualities in the administration of the affairs of a gas undertaking. A long experience of the methods of election of members of the boards of gas undertakings has shown that, while in some cases qualification and ability do enter into the selection, in all too many instances other reasons have prevailed. Men are sometimes appointed because they are large shareholders. This may be a very good reason in certain cases; but if they have not the required qualification and competence for the "job," then their election is against not only the interests of the shareholders generally, but their own interests particularly. Other men have been elected because of their glib tongues, and voluble and flowery expressions in proposing votes of thanks at the meetings of the shareholders. Such men, as a rule, are a perfect nuisance at meetings; but they sometimes manage to get their reward—from the board. Then friends of members of a board are often favoured. We have known of cases where, until there have been vacancies, the men elected by the board to fill them have not actually held the necessary capital qualification for becoming directors; but the deficiency has been speedily corrected when there were chances of becoming directors, and obtaining the fee. Notwithstanding, in those companies, there were long-time qualified shareholders—qualified in respect of capital and, more important still, in respect of the gas business. But from time to time they have been passed over. Then the principle of "one good turn deserves another" is frequently brought into play. By this means, an influential member of a board may secure a seat on it for a friend, and that friend obligingly reciprocates by obtaining the election of his friend to the board of another concern when a vacancy occurs. We have no objection to pluralist directors, providing they have the necessary qualifications for the posts, and have sufficient time and the inclination to give due service to each business. The diversity of experience of such men is oftentimes very valuable, if they know how to utilize it to the advantage of the various undertakings; but we do object even to such men obtaining seats on boards beyond their capacity for rendering proper and efficient duty to all. It may be said that members of boards are better qualified than shareholders for selecting new directors. In some cases, yes; in other cases, no. We have only to look around to see some grotesque effects of directorial nominations.

There is much that needs correction even in connection with the election of directors of gas undertakings. Indeed, it is a very good thing for some concerns within our knowledge that they have efficient and conscientious chief officials, that the directors realize this, and that they have sufficient intelligence simply to endorse the recommendations of those officials. But the true functions of directors go beyond this; and, as they hold offices of trust and responsibility, the composition of the board should be such that there is all the qualification and ability necessary to administer and direct. Otherwise, they cannot live up to the title of director. On all grounds, therefore, we are pleased to see the movement among the investing public to take a greater and more exacting interest in the qualifications of men for the administrative work of the enterprises in which they have invested their money. While they are doing this, there might be a beneficial sorting-out of the units of some existing boards.

A Pat on the Back.

It is only human nature to appreciate a pat on the back. The administering of such pats to the gas industry has hitherto been practised with great economy. In fact, so rare has been the recognition of any virtues on the part of the industry—though its products have become indispensable and an inseparable part of our industrial and domestic life—that it became necessary at one time for it to blow its own trumpet. A change has set-in. The trumpet-blowing has been successful; and now people are talking more and more of the accomplishments and the services rendered by the industry. In high places, too, recognition has increased; and the Gas Regulation Act is the evidence of an acknowledgment that, in the public interests, it is a politic thing to allow the industry more latitude for the expansion of its several resources and services. In a short article in "Nature," "J.S.G.T." gives the industry a pat on the back for its work in connection with coal conservation; and he describes its success in this regard, and indicates that the work is proceeding increasingly and with energy. There is no idea of relinquishing the work. The more the industry operates for development in its technical processes, the more

it realizes that the limits of development are for the time being indefinable.

In prefacing the account of what has been accomplished, "J. S. G. T." mentions that the annual output of coal in Great Britain is about 300 million tons, of which approximately 20 million tons are carbonized for the production of town gas. We have often wished that writers in technical and scientific papers would expand when dealing with this subject, and not refer to the carbonization of coal as though the process had only one object—the production of town gas—seeing that the yield of the carbonization comprises several other products of great importance to industry and to the country generally. This by the way. The writer reminds us that the investigators and prophets predict that in 600 years the coal measures of the country will probably be exhausted; and he asks, What then? No hope can rest in oil; for the scramble for this to-day, as well as the surveys that have been made, prove that a coal age will certainly not be succeeded by an oil age. It is suggested that possibly we shall have learnt to tap atomic sources of energy, or perhaps the earth's internal heat may be available to us after the manner suggested by Sir Charles Parsons. That is taking us into unknown realms; and there is little profit at present in contemplating anything of such a distinctly speculative nature. In connection with this subject, however, we have heard a great deal about what will happen to posterity in respect of fuel supplies. We cannot take any profound interest in the difficulties that may arise 600 years hence; we have sufficient of our own—present and actual—to satisfy all our desire for problems to solve. But "J. S. G. T." remarks that "there are those who hold "that how posterity will provide itself with supplies of "energy is posterity's own concern, and need cause us no "uneasiness; the gas industry takes a wider view. Its "processes are continually being examined with a view to "effecting greater conservation of coal." That is not the view; and we cannot accept such praise without qualification. There is no deliberate aim on the part of the gas industry to conserve our coal supplies—at any rate, not in the sense in which the writer in "Nature" presents the matter; and with what is being done there is no association of any considerations for posterity. The work in hand is of an immediately materialistic order. The whole idea is, by arriving at higher efficiencies and economies, to strengthen the position of the industry commercially, to the mutual benefit of the industry and the public. The conservation of coal is incidental to the primary object. The more that can be extracted from a ton of coal, the lower the number of tons that have to be purchased, transported, and carbonized to effect a given result in product; and naturally this contributes not only to financial improvement, but to coal conservation.

The writer shows, by reference to the reports of Sir Dugald Clerk and Profs. Cobb and Smithells, and of the Joint Gas Investigation Committee of the Leeds University and the Institution of Gas Engineers, the advances that have been effected in the efficiencies of production in ordinary carbonization, in the vertical retort system with steam, and in the blue-water gas and the carburetted water-gas processes. It is pointed out that Sir Dugald and his collaborators showed in their report of 1919 that the thermal efficiency of the process of carbonization of coal was from 70 to 80 p.ct., and that, debiting gas with the whole of the thermal losses of the process, and making allowance for transmission and other losses, at least 45 p.ct. of the heat of the coal carbonized is delivered to the consumer as inflammable gas. This latter figure is considerably improved if the coke is also converted into gas. The Gas Investigation Committee's reports have shown that the thermal efficiency of gas production in vertical retorts increased from 54·5 p.ct. without steam to 62·1 p.ct. with moderate steaming, while augmenting the yield of tar and ammonia. The addition of waste-heat boilers further raises the efficiency. But to the gas industry this, as well as the efficiencies of the water-gas processes, and of waste-heat boilers used in conjunction, all constitute old news now. Nevertheless, we are pleased to see the achievements of the industry recognized by a paper circulating among scientific men.

Of course, the gas industry is not going to rest content with staying where it is. The work that has been done satisfies it that there is space for further accomplishment—perhaps by a more complete gasification, with internal heating, and may be ultimately by the oxygen-steam process. We cannot yet tell. Work is proceeding in various directions, which has a guiding significance. "J. S. G. T." recognizes the further scope. He writes: "The work of the "Committee to which reference is here made is evidence of "the quickened interest on the part of the gas industry in "these matters, and an earnest of high efficiencies yet to be "realized, and a cheaper therm still to be distributed." An aid to this developing work is the therm itself; inasmuch as, for the first time in the history of the industry, it enables the relative efficiencies of gas production, by various processes, and in different places, to be compared on a scientific basis. One advantage of this is that processes that come before the industry with big production claims expressed in volumes, are now subjected to comparison on the thermal basis. On that basis, there can be no misleading those who are seeking to incorporate high efficiencies in their manufacturing operations.

The British Association Meeting.

IT was in 1896 that the British Association for the Advancement of Science last met in Liverpool. They will be meeting there again from Sept. 12 to 19, under the presidency of Sir Ernest Rutherford; and it is expected that between 3000 and 3500 persons will be drawn to the city specially for this fixture. In the twenty-seven years that have elapsed since the Association visited the city, scientific knowledge, through its votaries and workers, has made remarkable progress; and at no time during that period has science shown so much fecundity as it does at present in all matters appertaining to our physical, chemical, industrial, and domestic conditions. And even the activities of to-day, we may prognosticate with considerable faith, will look small compared with what they will be in another quarter of a century or so. Everything points to it. Research is developing in every direction; and its disciples are growing largely in numbers. Its importance is being appreciated in all influential quarters; and in it more and more money is being fruitfully invested. The discoveries made are simply the starting-places for fresh work and further discoveries. This is all reflected in the programme prepared for the meeting. It consists of fourteen closely printed pages. It reveals the facts that there will be thirteen sections, and upwards of 200 papers will be read. These will deal with a diversity of subjects, from simple domestic science to the higher altitudes of scientific theory and discovery in relation to the most abstruse subjects, while in-between falls the practical application of knowledge that accrues year by year. We shall expect in the engineering, chemical, and physical contributions to find matters that will be of interest to our readers. A meeting of the British Association rarely passes without something issuing that has concern for the gas industry. There is little doubt that past experience will be repeated this year.

Aspirations, and a Want of Recognition.

THERE are several things with which we agree in the Presidential Address which the Right Hon. J. R. Clynes, M.P., delivered recently at the annual meeting of the National Federation of General Workers; there are other things in it with which we disagree. But one also finds there the aspiration of many a devout trade unionist for greater power, which it is hoped to utilize to the larger advantage of the workers, whether or not economic conditions give warrant. There are some of the more sober-minded trade unionist leaders—such as Mr. Clynes—who are opposed to the utilization of force such as the strike, except as a last resource. We applaud this attitude; and yet all the time even such sober leaders are urging the acquisition of increased powers through the welding together of Unions and numbers. For what purpose? To make the application of force the more effective; always to have it ready for the heavier pressure it can bring to bear when there is demand for it in furthering the decisions—whatever their character, be they good or bad—of the Trade Unions themselves. We see this in the forepart of the address, where Mr. Clynes mentions how the duties of the Federation have during the past year—perhaps the worst of its existence—been limited almost to functions of guidance and encouragement for those constituent Unions whose members have been faced with demands for reductions of wages, and to offering resistance to "intolerable claims" made by employers. Then he proceeded: "Until there is "a more complete merging of Unions into one organization, "and an approach made to the state of amalgamation which

"is the ideal of so many trade unionists, the Federation "will always find in these and other services profitable and "essential work to do." There we have an aspiration—partially obscured, but sufficiently plain to strike the eye of the attentive reader and the ear of those who heard the deliverance—as to the realization of a power that will yield a maximum harvest to might over right. We have only to ponder the meaning of succeeding sentences to get confirmation of this. "In the days of good trade and a wide "demand for labour, a single trade union acting without "any other aid can frequently press demands for its mem-"bers with every measure of success." That is right; but this is wrong: "In the days of adversity through which we "have been passing, resistance can be effective only when "all the unions concerned act as a unit with a common "interest and a real determination to defend it." That is to say, even though the days are days of adversity, the only way by which the unions can defend a position which applies to days of prosperity is by acting as a single unit—by trying the effect of the might of numbers against inexorable adverse economic conditions. That will never succeed. It would only bring about a crash in which labour would be the predominant sufferers. But we cannot see, in these days of unofficial strikes, repudiation of national agreements (against which Mr. Clynes protests), and acute jealousies existing between the Trade Unions themselves, that there is any chance of a great consolidation of the different bodies which would ensure common action on all occasions. Trade Unions can no more afford in the interests of their members to crush the life out of industries than capital can afford the same insane act.

The President asserts that the reductions of wages forced upon the workers during the past year or two have been excessive, and in some cases cruel. The reductions have been of the additions that were made to wages to meet the hard days of war and subsequently; but, in various industries, a higher standard of living has been recognized, and in them the minimum level of payment will never again reach post-war level, so long as trade allows employment to be made. If the reductions were not justified by circumstances, there is no explanation of the extent of unemployment that exists in the country to-day. Mr. Clynes is the respected head of the Federation with which the gas industry works in harmony, and with a sense of fairness towards its employees; and therefore we feel a little resentment over the sweeping, and in no way qualified, statements that Mr. Clynes makes. Take this as an example: "The sacri-"fices of the worker in taking less pay for his toil have "not been accompanied by corresponding sacrifices on the "part of any other class associated with British industry. "In many trades, after wages being reduced, profits and "bonus were raised higher than ever; and no thought was "ever shown of calling upon those who had large salaries "or those who enjoyed substantial dividends or interest to "forfeit some part of their gains as a sacrifice similar to that "made by their workmen." What are the facts so far as the gas industry is concerned? During the war the investors in the industry—many of them poor people, many of them workers of the same order as those Mr. Clynes represents—had their dividends of (say) 5 p.ct. reduced to about half that amount, with the heavy income-tax to bear; and even now they are only getting approximately their pre-war dividends, and still with a heavy income-tax to pay. They have suffered the higher costs of living the same as the ordinary workers; and they have been forced into making sacrifices by the circumstances of gas trading. Even now the market values of their stocks and shares are not what they were when the holdings were acquired. Surely Mr. Clynes does not class the holders of capital in the gas industry with those who have made no sacrifices, and who are enjoying "substantial" dividends or interest. He cannot possibly call dividends round about 5 p.ct. "substantial" at any time—and especially in these days of high costs of living and heavy income-tax. There are exceptions to be acknowledged when strictures are being made even from the point of view of labour; and when the critic knows of the exceptions, common honesty should ensure their recognition.

We freely admit, and indeed are glad, that trade unionism has secured a permanent national position in the industrial life of the country. Trade unionism can be greatly helpful to the country and industry when properly directed; it can be very harmful when improperly directed. "Excesses" are spoken of by Mr. Clynes as though they originated only with the employers; history—and modern history—supplies many instances of excesses from the side of the Trade Unions. But strong as Mr. Clynes is in the trade union world, he finds that strength is best preserved by limiting the indictment to employers. People who are not trade unionists recognize this, and very properly characterize it a weakness.

The Statutory Therm.

In the excellent and variegated Presidential Address which Mr. T. A. Canning, of Newport, Mon., delivered last Saturday to the Wales and Monmouthshire Junior Gas Association, he regrets that the therm has not been made a Board of Trade unit, and thus placed on a level with the electrical unit. He adds: "We now, at long last, possess a unit which enables our product to be compared with electricity; but until our unit is fully recognized by the Board of Trade, we shall not experience the satisfaction which is our due." We do not know why there should be any want of satisfaction on our part; seeing that the "therm" has received enthronement in a measure which is part of the law of the land. In section 1 (2) of the Gas Regulation Act, the Board of Trade are authorized to substitute for pre-existing standard or maximum prices new standard or maximum prices "for each hundred thousand British thermal units (in this Act referred to as a 'therm')." With statutory recognition of the therm, there is no ground for "not experiencing the satisfaction which is our due" in relation to it.

Our Coal Exports.

There was an upward tendency in the export of coal during July. The total amount sent abroad was 6,767,255 tons, as compared with 6,588,651 tons in June. In May the figure reached 7,684,405 tons, which was the highest in any month this year. In July, 1922, the shipment was 5,003,763 tons; and the value then was £5,579,538, as compared with £8,841,301 for the quantity exported last month, as mentioned above. The value averaged per ton in May £1 7s. 10d.; in June, £1 7s. 2d.; and in July, £1 6s. 1d. Germany was a large buyer last month—1,295,325 tons, which make the purchases of that country this year upwards of 9¼ million tons. The quantity of gas coal shipped last month was 796,762 tons, as against 725,897 tons in July last year—the respective values being £999,291 and £771,107. The average price per ton last month was £1 5s. 1d. In the seven months of this year, 5,444,976 tons of gas coal have been exported; the total value being £6,628,796.

Gas Coke Exports.

During July, 82,806 tons of gas coke were sent abroad; the total value being £140,305, or £1 13s. 10·6d. per ton. In July, 1922, the quantity shipped was 54,516 tons, having a value of £74,629. The figures for the seven months show how considerably the business in the export of gas coke has expanded. The quantity has been 589,574 tons, as against 382,041 tons in the corresponding period of 1922—the respective values being £904,525 and £563,157.

Sulphate of Ammonia Shipments.

Last month 20,586 tons of sulphate of ammonia were exported, which contrasts with 7387 tons in July, 1922. During the past seven months, 144,146 tons have been sent abroad, as against 74,099 tons in the same period of 1922. In other words, the amount sold abroad so far this year has nearly doubled.

Petroleum Imports.

We were recently noticing the drop there was in the imports of petroleum products during the first six months of this year; but July showed signs of recuperation. In that month the total reached 134,691,722 gallons, compared with 120,851,884 gallons in July, 1922. But the smaller quantity of July last year had a value attached greater than the larger quantity of last month—the values being respectively £3,851,737 and £3,685,212. The import of gas-oil last month showed a recovery—6,098,746 gallons, compared with 3,536,220 gallons in July, 1922.

A Sign of the Times.

Elementary technical education must be spreading. According to his "Diocesan Gazette," the Bishop of Durham has come to the conclusion that it is not the sermons heard in churches

that are responsible for somnolence among the congregations, but the ventilation. In his opinion, the ventilation of churches is often atrocious; and inattention and restlessness are due to the fact that the members of the congregation are breathing a thoroughly vitiated atmosphere. In the churches' ministry, he says, nothing is unimportant; and he is convinced that the ventilation of parish churches tells more directly on the efficiency of the ministrations of the clergy than many other circumstances that may seem to be more plainly relevant. It is clear from this that ventilating gas-lights would appeal to the Bishop of Durham. He would quickly appreciate their beneficial action.

Motor Fuel Mixtures.

In an article on "Benzene as a Motor Fuel," the "Petroleum Times" regards this product as likely to become "the most important auxiliary motor fuel of the future"—particularly with a successful development of low-temperature carbonization of coal. The superior power of benzole over petrol has long been known; and its ability to reinforce petrol, used as a mixture, is also well recognized. It has also other virtues, as motorists have realized by use. The article recalls the statement of Sir Dugald Clerk as to the requirements of a suitable motor fuel. It also mentions that the respective calorific values of petrol of a gravity of ·75 and 90 p.ct. benzene of a gravity of ·883 are 132,500 and 150,000 B.Th.U. per gallon. Consequently, when benzene is used in an engine, not only is more power available, but the thermal efficiency of the engine is usually found to have increased. Thus the mileage per gallon is superior—the average of a number of tests being 22·7 p.ct. in favour of benzene. The tests were all taken without alteration to the compression ratio of the engine; but, as is well known, a pressure of 70 to 75 lbs. per sq. in. in a petrol engine may, to further economy in running, be safely increased to 150 lbs. in the case of benzene. Similar information has been published by the National Benzole Association; and there is the confirmation in practical day-by-day experience. The article concludes by stating that there is room for a huge increase in the production of benzene for mixing purposes alone—much more than is likely to be obtained for years to come. We can heartily endorse that view.

Coking Developments in France.

The capacity of France for producing metallurgical coke is being gradually restored; but at present it falls short of the production in pre-war times. M. Jean Pupier, an authority on the subject, has been studying the economic side of the question in relation to the continued increase of the production of such coke. He asks what purpose would be served in doing this if the necessary coal is lacking. The answer to this question has general interest, because it affects this country, and indicates changes in the character of the demand upon it. The output of coal in France last year was only 35 million tons; but the consumption reached about 63 million tons. It therefore becomes a question whether it would be better to import small coking coal than coke. The answer appears to be distinctly in the direction of a change to the former. M. Pupier says that small coking coal could be imported from Germany and England, and even the United States; and possibly at competitive prices. As to the importation of coke, recent experience has shown clearly that English or American blast-furnace coke, in the course of the many handlings it has to undergo in order to reach the French works, suffers considerable loss or waste—thus increasing the cost price. On the other hand, nothing of the kind occurs with small coking coal. Moreover, the latter is obtainable more easily from abroad than coke; and its conversion into coke in France would also yield the advantages of gas for power purposes and the valuable bye-products. This indicates the possibility of France preferring in future to buy the raw material from us rather than the manufactured.

Slump in Trade Unionism.

Trade unions are passing through bad times just now. They are not immune from the ups and downs to which other people are subject. The Federation of General Workers, in which the gas industry is so intimately interested, supply a remarkable illustration of the slump in membership which is now being experienced. According to the report of the Executive Council, which was presented at the recent annual conference, the membership of the Federation reached the peak of 1,293,793 in 1920; it has since dropped to 543,303—or by more than one-half. This is attributed to industrial depression. We rather think there is another cause. It is that, while wages are on the up-grade, there is a tendency to flock to the banner of trade unionism; when on the down-grade, there is a marked tendency to forsake it.

The Miners' Federation.

Since the great strike, the Miners' Federation have shown on more than one occasion a desire to avoid further conflict, and to gain their ends by the ordinary and politic means of discussion and negotiation. The annual accounts of the Federation to June 30 last disclose what is possibly the strongest incentive to the peaceful policy. The general fund account shows an excess of expenditure over income of £44,875. An interesting item is the loss of £38,403 on "investments." It appears that the Federation owned £43,670 of "Daily Herald" debenture stock; and this was exchanged into 2s. shares of the Victoria House Printing Company, Ltd.—thus producing the loss named. The "Morning Post" has asked some pertinent questions regarding this loss; but we have not yet seen a reply. The "Iron and Coal Trades Review" recalls the interesting fact that, as a result of the ballot on the question of a political levy, only 261,000 out of 645,000 voted in favour, and, in 1921, 152,000 out of 769,000 claimed exemption.

The Dockers' Loss.

It is not altogether clear that it is so, but there seems to have been some connection between the hasty manner in which the London dockers scurried back to their work and the decision of influential bodies to put to the test the legality of the payment of doles and other relief to the strikers out of the rates. However, whatever the reason, the men were back at work on Tuesday morning last week; some were eager to report themselves for work on the previous day; and certain of the unofficial leaders are said to have been among the first to return to duty. This was a tame ending to all the tall talk of the weeks preceding. The Amalgamated Union of Lightermen, Stevedores, and Dockers—the new "Union" resulting from the strike—is not expected to have much power or a prosperous career in opposition to the Transport and General Workers' Union, with its membership of between 300,000 and 400,000 members. The membership of the new Union is said to be 15,000; but there are doubts as to this being a figure that can be included in the category of truth. The irregular action of the strikers is to be considered at the Trade Union Congress, which will open in a few days at Plymouth.

Working Hours.

A long-disputed question has been settled by the publication of Sir Hugh Fraser's award as to hours in the building trade. A forty-four hour week has been established, other than in summer time as determined by statute, or definitely for twenty-one weeks from about the third week in April to the middle of September. Then a week of 46½ hours is to be observed. This is obtained by the addition of half-an-hour to each of five days in the week. By mutual consent, employers and operatives may maintain the forty-four hours throughout the year. Another clause prevents any general extension of hours until unemployment is reduced to a small given percentage. The masters welcome the award owing to the break it effects in the continuity of the forty-four hour week. It is a sort of compromise; but there are indications that both sides are prepared loyally to stand by it.

OBITUARY.

The death occurred last week, at the age of 82 years, of Mr. W. B. REDFERN, of Cambridge, who was one of the best known men of the town, and was a Director of the University and Town Gas Light Company. His store of energy, which he expended for the good of the community, was the admiration of all who had the good fortune to come into contact with him.

The death took place on the 17th inst., in his 89th year, of Mr. JOHN NIVEN, who was for 37 years Engineer, Manager, and Secretary of the Clayton Allerton and Thornton Gas Company. He commenced his career in the gas industry at the works of the Leeds New Gas Company, afterwards serving at Morley, Dewsbury, and Birstall, prior to taking up the post at Clayton. When the Bradford Corporation purchased the undertaking in 1902, Mr. Niven's services were retained until his retirement from active work. Mr. Niven was well known in Masonic circles; and his loss will be felt by a wide circle of friends.

ELECTRICITY SUPPLY MEMORANDA.

We have just been reading a pamphlet, headed the "The Home of 1923." In one of the lower corners of the cover, the initials "E.D.A." are seen. The pamphlet is invitingly got up, and anyone into whose possession it comes is bound to read it. It advocates the use of electricity in the home; where electricity is used, it is said, "you have light, heat, and help laid on." Of course, electricity has not a monopoly of "light, heat, and help." There is another labour-saving agent which has a much larger range of heating and helping capability. The pamphlet is written in an intensely platitudinal style. Electricity solves all the old-age difficulties; it attacks the chief cause of labour—dirt and damage; and—the glory of it all!—"it enables home work to be made quite easy and as nearly automatic as we can expect so important and complex an occupation to become." Users of electricity for lighting, heating, and cooking can also employ electric power to do the remaining tasks in the cleanest and simplest way. We imagine that most householders have by this time heard that electric heating (like gas) saves the cleaning of hearths, the chopping of wood, the use of paper and matches, the carrying of fuel, and continuous cleaning and dusting; that electric cooking reduces the waste of meat, and preserves flavours and food values; also that the electric cooker produces no fumes. All this is ancient history now; and it has by frequent use become commonplace. These pretty, if antiquated, statements are again made within the attractive cover of this pamphlet; but not a word is printed about the costs of installation, appliances, operation, and maintenance, or as to the depreciation of heating elements, and so forth. That is the information for which the householder looks who is contemplating revolutionary changes in his home. But on every one of these points there is silence in the pamphlet. To accept the advice given in it, one would have to possess a very long pocket, or borrow the money with no intention of paying it back. Something is said as to water heating. Large quantities of water, it is stated, are generally supplied from a central point, as from the boiler of a kitchen range, or a special water-heater fired with coke or rubbish. But electricity comes in for the heating of small quantities of water. Nothing is said as to the money and time saving of gas over electricity for the purpose, and this is hardly expected. But there is a passing reference to that ludicrous method of obtaining in bulk a few gallons of hot water by waiting twenty-four hours for it. This is what is said: "For example, it is possible to obtain 10 gallons of water heated from about 55° to 150° Fahr., with a consumption of a little over 3½ units of electricity. This spread over the 24 hours can often be obtained at low rates." That is not so bad as some published statements. It only represents about 80 p.ct. efficiency; while we know electricians have published figures which show 100 p.ct. efficiency, and no heat leakages by radiation, &c., as though the inflow of heat to stored water can go on hour after hour without some loss. The expenditure of 3½ units of electricity is heavy for heating up 10 gallons of water to 150° Fahr. But then a unit of electricity has only a potential heating value of 3420 B.Th.U. This is sad for the electricity industry; but then, the fact cannot be altered.

The Home of 1923.

Electric Cookers on Hire.

The South Shields Corporation are considering the question of supplying electricity for the purpose of cooking on the Cleadon Estate. The Electrical Engineer (Mr. James Edgar) was asked to report on the subject; and he has done so. But his report bears all the marks of a man who appreciates the difficulties and has done his best to make-out a good case by trimming-down costs to the lowest possible level. Notwithstanding, there is doubt as to whether the charges that it is proposed to make will suffice. Mr. Edgar has apparently approached the subject from the standpoint that, in the eyes of the public, the cost of the electric-oven is the only matter that interrupts adoption. Of course, there is a great deal more than that. The cost of heat by the electrical method is another obstacle. However, Mr. Edgar is of opinion that the advisability should be considered of supplying electric cooking apparatus on hire or rental—not only to consumers on the Cleadon Housing Estate, but throughout the whole area of supply. It seems that on the Cleadon Housing Estate there is no supply of gas. Discussing the general question, Mr. Edgar says the initial expense of electric cookers appears to have been the deterrent to installation in the past—some cookers costing considerably over £20. But he finds a tendency to place on the market cheaper apparatus; and the quotations he has received range from £4 to upwards of £20. With electrical apparatus, one may be quite sure that, if the best cost £20 and the worst £4, in the interests of the electricity undertaking itself the consumers should be defended against the deficiencies of the lower priced cookers—from the points of view of working sufficiency and efficiency and maintenance. It is impossible for such great differences to exist in prices unless they are obtained by the manufacturer by a curtailment of production costs in every direction. It may be said that differences obtain in the prices of gas-cookers. Quite true; but they are caused more by size and finish than anything else. There is not the same complication in a gas-cooker as in an electric oven and hotplate, with the heating elements, switches, fuses, earthing, and what not.

Initial and Maintenance Costs.

Mr. Edgar does not recommend the smallest type of oven costing £4; this being too small for family cooking. He is wise in this. As he points out, the ordinary coal-fired kitchen range contains an oven which will take four loaves of bread at a time; and as home bread-making is carried on to a considerable extent in the district, it is necessary to provide an electric oven of similar capacity. He has come to the conclusion that a suitable one can be obtained at a cost of £6 net. Even with this cooker, he finds that it takes the hotplate too long to boil a kettle or pan. To overcome this, he suggests the oven unit, and a "boiling-ring" unit, which latter could be bought for £1 net—making the total cost £7. As an alternative, a grill and a boiling-ring are suggested, costing £4. Spread over a period of eight years, the interest and sinking fund charges would for the oven and boiling-ring amount to £8; or for the grill and boiling-ring £4 10s. The charges to be made against the consumer would be respectively 5s. and 3s. per quarter for eight years, after which no further rental would be charged. Nothing seems to have been taken into account for installation costs; and Mr. Edgar confesses that maintenance expenses have not been included. But he attempts to give satisfaction regarding this by saying that, with "reasonable care" on the part of the consumers, the maintenance should not be a very heavy item. With "reasonable care" on the part of the consumer! Mr. Edgar's idea of reasonable care may not be that of the consumer. If he had had experience of the diversity of care exercised by consumers in their treatment of the more hardy gas-cooker, he would have hesitated to talk of care that could be described as "reasonable" as a general attribute of the use of such appliances in the kitchen.

Running Costs.

A suitable tariff will be necessary. Mr. Edgar's idea for this is a single-meter tariff, with an initial charge for a certain consumption of energy, and a low secondary charge for all additional consumption. In his opinion, this would enable the consumers to carry-on their heating and cooking on the most advantageous terms. But householders do not consider what are and what are not "advantageous terms" within the limits of electrical connotation. They look farther afield, and make comparison with the costs of doing the work by other sources of heat. In that way, and that alone, they are able to get at what are advantageous terms from their point of view. To proceed, Mr. Edgar estimates that the average number of units used per house for cooking purposes would be approximately ten units per week, which, in round figures, would be equivalent to 500 units per annum. This is a very economical computation. Considering the thermal value that 10 units of electricity represent, and taking into account the actual efficiencies of oven and hotplates (not the all-round 100 p.ct. efficiencies that dwell in some electrical imaginations), we are satisfied that 10 units are insufficient for a family's cooking per week, including the four loaves of bread baked at one time and all the boiling operations connected with meals. Anyway, the 10 units of electricity would not provide the heat required for the amount of work that is done on the gas-cooker—oven and hotplate—in the average working-class household. We are afraid that, in constructing his case, Mr. Edgar has been guided too much by economy; and estimates so framed often experience the humiliation of not receiving confirmation in practice.

Heating Demand in Glasgow.

The question of cooker installation in Glasgow has been much to the fore in the past twelve months; but in the annual report of the Electricity Committee there is no specific mention of the matter. There is merely an incidental reference in a paragraph dealing generally with electric appliances. The charges for B.Th.U. by electricity for heating are not by any means cheap. For any quantity of current for heating purposes where energy for lighting and heating is taken through separate meters on premises other than domestic, the price is 1½d. per unit. There is what is called a special rate for domestic purposes: With respect to current for cooking, heating, or other domestic purposes, for all over 800 hours' use per annum of the maximum demand for lighting, where energy for lighting and power is taken through the same meter, the charge is 1d. per unit. Where a separate meter is used for heating or cooking supply, the charge is 1d. per unit. Another item in the tariff is, where a supply of current for power and heating is given, a minimum account of £2 per annum payable in advance; but from any account for current used by the same consumer for lighting the same premises is to be set-off the minimum charge. The charges for lighting are 5d. (with 1½d. for current over the equivalent of 600 hours of the maximum demand) and 4½d. Power charges run from 2½d. per unit to 1½d. As to the information regarding appliances used for other than lighting in domestic and business premises, it is stated that there is a "noticeable increase." In domestic premises, there are now over 21,000 appliances—heaters, irons, cookers, cleaners, &c.—equivalent to a demand of 19,700 kw.; and in business premises, upwards of 11,000 pieces of apparatus, equivalent to

a demand of 15,800 KW., or a total of over 32,000 appliances, with a demand of 35,500 KW. This, it is remarked, is a class of demand that should be encouraged—particularly in domestic premises. "Domestic consumers are a stand-by to any electricity undertaking, and everything should be done to develop the use of current for purposes other than lighting." It will be seen from the foregoing figures that few of the appliances can be of a large consuming order. Domestic appliances average out to only 0·94 KW. per appliance; and the industrial ones to 1·4 KW. per appliance. Other interesting figures are: For lighting 34,350,030 units were sold, and brought in a revenue of £464,489; 104,380,865 units were sold for power and heating, which contributed to the revenue £531,189. Thus it is seen that three times more units were sold for power and heating than for lighting, but they only yielded £66,700 more revenue. The increase in the number of units sold to private consumers was equal to 7·83 p.ct.

Cooking by Coal and Electricity in Switzerland.

It is useless to base any reliance upon comparisons regarding the costs of cooking by coal and electricity such as the "Electrical Times" has published in relation to a Swiss sanatorium. They do not represent even approximately the conditions existing in this country; and one of the important factors is absent which would enable one to place the figures upon a comparative basis. The information was published by the "Bulletin de l'Association Suisse des Electriciens." The experiments embraced electric and coal cooking separately, and a combination of the two. The three methods were each used a week at a time, and in rotation, throughout a year; 180 persons being catered for. The maximum capacity of the electric cooking apparatus was 75 KW. The cost figures, including wages and all water heating, were as follows:

	Frs. per Day.	At 25 Frs. to the £. s. d.	Cost per Person. d.
Cooking by coal	19·30	.. 15 7½	.. 1·04
Cooking by coal and electricity	18·46	.. 14 9½	.. 0·984
Cooking by electricity—			
In winter, with coal heating of kitchen	15·41	.. 12 4	.. 0·822
In summer	14·51	.. 11 5½	.. 0·763

Cooking by electricity therefore effected a saving of 1584 frs. (£63 3s. 6d.) compared with coal. On an average 1·34 KW.-hour were found to be equivalent to 1 kg. of coal. This comparison is altogether deficient owing to the absence of the cost of coal per ton. We know that in Switzerland it is abnormally high, while the price of water-generated electricity is very low. The cost of electrical energy used in these tests is 0·1 fr. (0·96d.) per unit for cooking and 0·04 fr. (0·384d.) per unit during night hours for water heating. Sterling values are calculated at the rate of 25 frs. to the pound.

Low and High Prices for Wiring.

There is no abatement in the complaints of electrical contractors as to cut-competition and the use of foreign and inferior materials by men who are out for jobs and profit, without any consideration for reliability and efficiency in service, and the reputation of the electricity industry. Those who have regard for these matters wish that the insurance companies and the electricity supply authorities would insist on work being carried out to an approved standard. There does not appear to be any movement in this direction; but there can be no question that what is going on, including the closed eyes to indifferent work, will in time recoil on the industry. Present scooping-in of connections seems to be more important than permanent satisfaction and safety. Meantime, the imports of German electrical plant and goods are going-up by leaps and bounds. "Megohm" in the "Electrical Times" says he was recently speaking to a small wiring contractor who told him he had to buy foreign plugs, for he had to compete with wiring estimates at 16s. and 17s. a point. "Megohm" asks how it is that one never meets the firms face to face who put in these low quotations for wiring? He adds that the excuse for buying in the cheapest market is always that other people are offering to wire at ridiculous prices per point. He proceeds to ask what it is that keeps up the cost of house wiring? That is the important point; and most inquirers will find that the main cause is labour, and not the differences there are in the costs of switches, plugs, and lampholders, cables, conduits, and other materials. These make a difference, but not the principal one. "Megohm" suggests that time-sheets and labour costs applying to before the war and now, should be turned up and compared. If this were done, something informative would no doubt be obtained. The building trade has found that in some lines of their work it takes men longer to do a job now than prior to the war. The corrective of this would be piece work; but this is a system that cannot be adapted to all cases.

Neglect of Regulations.

The report of the Chief Electrical Inspector (Mr. G. Scott Ram), which was noticed in the "Memoranda" last week, indicated that certain of the accidents and fatalities which occur in factories and workrooms are due to non-observance of the regulations—not necessarily in all cases on the part of employers, but of the men. Another case has happened in connection with an electric-welding job inside a boiler. A welder, named Charles Keeling, was killed. According to the evidence at the inquest held at Mansfield recently, deceased was reinforcing parts of the boiler, using an electrode in a "universal" holder. In the ordinary course of circumstances, the electrode would have been some 16 to 18 in. from the face of the operator; but it was found that both about the mouth and on the back of the neck deceased had been severely burned. It was also stated that the man was a careful worker; and that the same type of holder had been in use for three years without a single mishap. A pressure of 70 volts, reduced from a supply pressure of 220 volts, was employed. Mr. Swann, who represented the Home Office Electrical Department, pointed out that special precautions had to be observed when the higher voltage was used; and he elicited the admission that these precautions had not been taken. In this case there were small projections of bare metal on either side of the holder; but it was asserted that, when issued, the holder was efficiently insulated; but it is obvious that it was not when in use on this occasion. A verdict of "Death from electric shock" was returned—the Coroner expressing the hope that those concerned would make themselves better acquainted with the regulations. It should be obvious to everyone that "efficient insulation" is not a condition that has everlasting life.

VALUATION OF GAS-WORKS IN SCOTLAND.

Local Rates.

[CONTRIBUTED BY AN EXPERT.]

THE subject of the valuation of gas undertakings for assessment purposes is one of paramount importance at the present time not only to the consumers, but also to the shareholders. The Scottish Valuation Roll was published on the 15th inst., and appearing therein are the new assessments for a large number of gas-works throughout Scotland; and the increases in the assessments are in many instances very great.

The subject of the assessment of gas undertakings is a highly technical one, and to very few are known the proper methods of arriving at the assessments. What has to be determined is the "rent that the hypothetical tenant would give for the property in its existing state," having regard to all the circumstances and conditions appertaining to the heritage. For a very considerable period no settled principles seem to have been recognized in regard to profit-earning corporations supplying gas, &c.; and not until 1883 was any attempt made by the various gas companies to have such principles settled. By a series of hearings which culminated in the decisions in the Kirkcaldy case in 1905, and in the Edinburgh and Leith Gas Commissioners *versus* the Assessor for Edinburgh in 1909, the proper methods to be adopted were laid down. In the latter case Lord Low said that "in fixing the annual value of undertakings of the kind with which we are dealing (gas), what is called the revenue principle ought in general to be adopted." It can therefore be taken that it is settled law that the revenue principle of valuation should be adopted in arriving at the letting value of a gas undertaking.

The first step in the computation of the letting value of a gas undertaking is to ascertain the gross receipts. The gross receipts would consist of receipts from gas and from residuals sold, this being the principal revenue of the concern. From the gross receipts have to be deducted the expenses necessarily incurred by the tenant to earn such receipts. Any expenditure incurred on behalf of the landlord's property must be excluded. Having deducted the tenant's expenditure from the gross receipts, the resultant figure would give the net receipts. These net receipts have to be divided between the landlord and the tenant—the landlord in the form of rent, the tenant in the form of remuneration for capital which he would have to provide in order to earn the receipts. The principal difference on the question of the valuation of gas undertakings arises between experts on this important question of tenant's capital.

TENANT'S CAPITAL.

Let us for one moment consider what capital the tenant of a gas undertaking would require to earn the receipts. The tenant would have to make and supply the commodity for a certain number of months before he could collect the receipts. He would therefore want a certain number of months' working expenses, to provide himself with coal from which to make the gas, the necessary wages, and other outgoings about the works, until such time as he could render his accounts for the gas supplied. But in this connection it must be borne in mind that, in late years, a new factor has arisen in the introduction of the slot meter. In the period allowed for the tenant's capital for the working expenses, a credit must be deducted for such period that the slot-meter receipts have been collected. It may be that these slot-meter receipts are collected weekly, fortnightly, or monthly; but whatever the period may be, this must be taken into consideration. The number of months' working expenses would be the first item in the tenant's capital.

The next question that would arise in the mind of the prudent tenant would be as to the number of weeks' reserve stock of coal that he would require—more especially in view of the unrest which has been of late years experienced in the mining industry.

Years ago it was the common practice to provide a sum of money sufficient for four weeks' stock of coal. Subsequently this was increased to six weeks; and to-day many gas companies consider it both necessary and expedient to provide at least twelve weeks' stock of coal. The writer has agreed with a large number of Assessors who deal with gas-works valuations throughout Scotland for an allowance of eight weeks. But in any event, in a valuation of the tenant's capital necessary to work a gas undertaking, an item should be included for a reserve stock of coal.

Another item in the tenant's capital is that of the office furniture, stores, tools, implements, and various other articles in the offices and about the works. An adequate valuation should be put on these various items and added to the tenant's capital.

The next item—and the writer desires to call special attention to this—is that of meters and cookers in use, in store, and under repair. Meters at the present time consist of what are known as ordinary meters and slot meters. It is customary among experts to make a valuation of each and all of the meters, dealing with them in their various sizes according to the number of lights, and adding to the present value a sum sufficient to cover the cost of stamping fees, main cocks, &c.—*i.e.*, the value for assessment purposes should be as fixed. As regards cookers, here again it is customary to make a complete valuation according to size and various makes which have to be dealt with. And last of all in connection with the meters and cookers there is a further item which the tenant of a gas undertaking would necessarily have to incur, more especially with the prepayment meters—that of the installations.

In connection with the provision of a sum of money for the supply of cookers, it is necessary to call attention to an important case which was brought before the Lands Valuation Appeal Court on the specific question of cookers. In 1905, the Kirkcaldy Gas Light Company appealed against their assessments; and one of the grounds of appeal was that no allowance had been made for tenant's capital in respect to the cooking-stoves supplied by the Company. Lord Low in his judgment said:

> "The main question in this case is whether, in estimating the amount of floating capital which a tenant would require to enable him to carry on the gas-works, the amount which it would be necessary for him to pay for meters and cookers should be included. I think that the cost of cooking-stoves may at once be set aside, because it is not necessary for the carrying-on of the business for making and supplying gas that the tenant should supply cooking-stoves. That is a branch of business which he might or might not find it expedient to carry on."

It is submitted that, under the different conditions subsisting to-day, it is essential, in the vast majority of gas-works, for the undertakings to supply cookers and stoves. In fact, it is within the knowledge of the writer that in a large number of instances the supply of gas for cooking and heating is the principal portion of the business; and in the vast majority of cases in Scotland which the writer has dealt with, the Assessors have taken the view that gas-cookers should now be included as part and parcel of the capital that the tenant would necessarily require in order to earn his receipts.

The last item in the calculation of the tenant's capital required would be for cash at bank. In the previous items which have been included in the tenant's capital, the necessary funds have been provided to work the concern for a certain period, and for purchasing the meters, cookers, &c. It is submitted that no prudent tenant would enter upon the occupation of a gas undertaking without providing himself with certain funds as surplus cash. For instance, a rate is payable on demand; and though in practice local rates are not paid on presentation by the collector of the demand note, a prudent tenant would provide himself with the necessary funds to meet all such outgoings. The foregoing items added together would embody the total sum of the capital which the tenant would necessarily have to provide.

Amount of Remuneration.

The next question to be considered is the amount of remuneration the tenant should have on the capital which he has provided in order to earn his receipts. It has been the practice for many years in Scotland to take 5 p.ct. as the tenant's interest. The writer has agreed in many cases recently for 7 p.ct. as interest on the tenant's capital; and even now it is very questionable whether, having regard to all the conditions governing the industry, 7 p.ct. is adequate remuneration on the capital provided. It is suggested that 10 p.ct. would be a fairer allowance.

The Rental Value.

Having applied the proper percentage, or the agreed percentage, of the total amount of the tenant's capital, this sum would be deducted from the net receipts found, and from the resultant figure 20 p.ct. is usually deducted as representing the tenant's profit. After having deducted these figures, the resultant figure would be the rental value, *plus* rates. The local rates are the final figure to be deducted.

With reference to the deduction of the local rates, in the past it has been the custom to deduct the actual rates paid by the tenant; but it is submitted that this is erroneous. The proper method of deducting the rates is to multiply the final figure in the valuation by 240, to bring it to pence, and divide this by 240 *plus* the actual rates in the pound for the district in which the gas-works are situated. The figure then found is the true rent that the hypothetical tenant would give.

It has been customary in Scotland, in order to make a computation of the letting value of this class of property, to base such calculation on the average of three or five years' accounts; and, in order to assist the industry as far as possible, the writer is attaching hereto a specimen valuation of an actual undertaking which has been dealt with for the Valuation Roll 1923-24. The original valuation of the Assessor was £5409, and the rental value finally determined on behalf of the Company was £1905.

It may be appropriate to say here that the writer disagrees with the deduction of the tenant's rates only, notwithstanding the fact that it has had the approval of the Lands Valuation Appeal Court in a large number of cases. In the particular instance here set out, there should be a further deduction made of £600 in respect of owner's rates. The result of leaving the owner's rates in the valuation determined is that both the owner and the occupier are paying rates upon rates representing a sum of £390 per annum; and it is suggested that the gas industry in Scotland would do well to re-open this question before the Lands Valuation Appeal Court at the earliest possible opportunity.

Estimate of the Rental Value of the Gas Undertaking Owned and in the Occupation of the "A.B.C." Gas Company, Limited, Based on the Accounts for the Three Years Ended Dec. 31, 1922.

—	1920.	1921.	1922.	Average.
	£	£	£	£
Receipts.				
By sales of gas	17,988	20,157	24,276	..
,, Residual products sold	6,985	9,507	5,268	..
	24,973	29,664	29,544	28,060
Working Expenses.				
To Coal	12,066	13,373	11,537	..
,, Lime	..	278	..	..
,, Tenant's maintenance and repairs	3,784	3,408	3,257	..
,, Stationery	75	138	74	..
,, Wages	4,213	4,992	3,987	..
,, Salaries and Directors' fees	1,043	1,227	1,301	..
,, Railway carriage & cartage	11	57	82	..
,, Sundries	150	157	210	..
,, Bad debts	..	1	8	..
,, Insurance	105	115	156	..
	21,447	23,746	20,612	21,935
Net receipts, *plus* rates and taxes				6,125
Tenant's Capital.				
Five months' working expenses	8,936	9,894	8,588	..
Eight weeks' reserve stock of coal	1,856	2,057	1,775	..
Office furniture, stores, tools, instruments and implements, &c.	1,400	1,400	1,400	..
Meters on hire, in stock, and under repair	12,715	12,715	12,715	..
Cookers on hire and installations	14,188	14,188	14,188	..
Cash at bank	2,497	2,966	2,954	..
	41,592	43,220	41,620	..
Average of three years, £42,144 at 7 p.ct.				2,950
				3,175
Deduct 20 p.ct. for tenant's profits				635
Rental value *plus* rates				2,540
Deduct rates at 6s. 8d. in the £ on rental value here found—viz. $\left(\frac{£2540 \times 240}{240 + 80} = £1905\right)$				= 635
Rental value of works and mains				£1,905

Assessment appealed against, £5409.

Lectures on Gas-Fired Boilers and Water-Heaters.—Messrs. Spencer-Bonecourt, Ltd., of Parliament Mansions, Victoria Street, S.W., have arranged lectures on their gas-fired boilers and water-heaters, and also on their boilers for utilizing the waste heat from gas engines. These lectures have been given to the staffs of some of the London gas companies, who have realized the great possibilities in these directions. The Spencer-Bonecourt Company will be pleased to arrange for one of their technical staff to give a short lecture to any of the provincial gas companies at any time to suit their convenience. The lectures can, if desired, be illustrated with lantern slides.

A New Smokeless Fuel.—It is announced that Prof. S. Roy Illingworth, of the Chemistry Department of the South Wales and Monmouthshire School of Mines at Treforest, has produced a smokeless fuel with a greater heating power than ordinary coal. It is claimed that it is more suitable for domestic purposes, as there is little or no ash. Plant is to be installed for the purpose of testing the commercial possibilities of the fuel. Experiments are said to have been made with all kinds of coal, and the fuel turned-out has been tried under test conditions under a boiler against the best quality of Welsh steam coal. After a twelve-hour test, the fuel obtained by this method showed itself to be equal to the coal for steam-raising purposes.

GAS ADMINISTRATORS AND THE EDUCATION SCHEME.

By WALTER HOLE.

THERE are one or two points in the Editorial of last week's "JOURNAL" under the above heading which evidently call for further elucidation.

TRAINING AND FINANCIAL RESULTS.

First of all, it is good to observe that a foremost place is given to a side of the question which, up to the present, I am afraid, has not been generally appreciated—that is, of the relation of technical education to the financial side of the industry. It is generally agreed to be necessary that the technical staffs of the industry should be exceedingly well trained. But why? One reason undoubtedly is that the higher the technical training of the staff, the better and cheaper the works will be run. We have only to look at the opposite side to realize this. Lack of technical training or very inadequate training undoubtedly spells rule-of-thumb methods; and such are always wasteful and extravagant. On the other hand, proper and sufficient technical training means intelligence and interest; and these, other things being equal, will ultimately spell economy and efficiency. While it is impossible to set any definite and precise monetary value to these in the balance-sheet of an undertaking, or even to show them there at all as such, yet there is hardly an item in that balance-sheet which is not profoundly influenced by them. The relation, therefore, between technical training of its staff and the balance-sheet of any undertaking is quite simple, direct, and extremely important.

Take another aspect of the question. Competition to-day is very keen. New business has to be fought for as never before. Even the retention of existing business is continually and persistently challenged. Strenuous as the conditions are to-day, they will probably be more so in the future. In these, as in so many other directions, the pace grows every year. How are these conditions to be met? They can only be successfully encountered by a highly-trained technical staff. It is useless for any man to seek new business, or even to endeavour to retain old connections, who does not know what he is talking about. The successful man is one who not only has a thorough knowledge of his own side of any question, but who is also able to meet and beat competitors on their own ground. Here, again, the relation between technical training and the balance-sheet of an undertaking is very close. If that balance-sheet is to be a prosperous one, old business must be retained and new business secured. If the previous contention is right, and these ends cannot be attained except by a highly-trained technical staff, then the instinct of self-preservation must surely, in the long run, convince even the most conservative undertaking that technical training is not a fad, but a vital condition of existence.

It follows inevitably, therefore, that every penny spent on the technical training of those employees and members of staff capable of profiting by it is money well spent. It is an expenditure which will bring the hundredfold return to the undertaking incurring it. Just how and when and where, it is, of course, impossible to say. This will depend on local conditions. The operation may be largely hidden. The application of technical intelligence may, under normal working conditions, be quite silent. It may make no noise and draw no very pronounced attention to itself. It cannot be tabulated. It is often impossible to say, Lo! here or Lo! there. Just as the mightiest forces of Nature are silent in their operation, so this impalpable force in the daily routine of the work of an undertaking may in detail be undemonstrative, but, in the gross, exercise a tremendous influence on the balance-sheet of that concern.

CONTRIBUTIONS OF EMPLOYERS AND EMPLOYEES.

In the development and application of technical training, obviously both employer and employee have their definite contribution to make. To take the latter first. The scheme provides for an attendance at classes for tuition for two hours per night, for three nights per week, during the whole of the winter session. This is to say that, after doing a day's work, the student must sacrifice his well-earned leisure, and his recreation, for hard study and severe mental training. But attendance at the classes is only part of the course. In addition, homework and private reading —both absolutely essential if the class work is to be profitable to the fullest extent—make a further demand on the small amount of leisure time still remaining. And all this not for one winter session only, but for five years onward consecutively before the examination for the higher certificate can be reached. Even with this allocation of time, the necessary subjects can barely be covered to the extent necessary for adequate training.

But the sacrifice of leisure, and hard mental work, are only part of the student's contribution. Attendance at class involves class fees and travelling expenses. The latter may range from cheap tram or bus fare to a fairly heavy train fare. But, heavy or light, it comes at that period of a student's career when earnings are very slight and every copper tells. Then, on the top of all this, comes the necessary expenditure for text-books, note-books, instruments, &c., which, in the aggregate, constitute a further considerable drain on resources often seriously depleted by the previous expenditure to which reference has been made. Putting all these together, it is evident that the student's contribution to the body of technical training necessary to the prosperity of the industry is a very heavy one.

It is because the burden on the student is thus shown to be very heavy, while at the same time the adequate training of the technical staff is absolutely essential for the prosperity of the industry, that an appeal is being made to the administrators of the industry to ease the burden somewhat. A recent circular asked for the repayment of class fees and travelling expenses to deserving students. This would constitute an infinitesimal charge on the resources of any undertaking, and would be much more than repaid in more efficient service. But while the expenditure would be so slight from the point of view of the undertaking, the relief to the individual student would be very great indeed.

The burden on the student may not only be eased on the financial side, but also on the educational side. It is a tremendous demand to make upon the youth of an industry that they should be asked to devote practically the whole of their spare time during many months to study. It was a realization of this that was at the back of the request for facilities for daytime studies made some time ago. The grant of one or two half days per week to suitable students for attendance at class would be a great boon to both teacher and pupil, while not becoming a very serious consideration to a gas undertaking. Even the time demanded is really insufficient for the purpose. This additional time would enable subjects to be more adequately covered and more thoroughly dealt with. It would certainly conduce to the time involved being more profitably spent. A previous day's work is not the best preparation for class tuition. To say the least, it does not conduce to alertness of mind. The mental faculties are bound to be somewhat dulled by the previous expenditure of physical energy in the course of daily toil. In such circumstances, it is impossible to obtain the fullest return from the tuition given; and by so much as it falls short, the course is a wasteful one.

The grant of daytime facilities for class attendance would also be most beneficial on the financial side to those who have to incur travelling expenses for this purpose. An arrangement would be made for suitable evening classes to follow those of the afternoon, with, of course, a suitable break, and thus double the class work done for one railway expense.

REWARDS TO STUDENTS.

With regard to the very closely associated subject of rewards, the Birmingham scheme strikes a very happy note. If technical study and training spells greater competence and interest, and therefore greater economy and efficiency in working, as they undoubtedly do, these should as surely be reflected in the salary or wage. In this way gas administrators can give a tremendous amount of encouragement to the struggling student. The award of an extra £5 in salary to the candidate who secures a first-class in the ordinary grade, and of £10 to the candidate who wins a first in the higher division, together with a monetary award to one who secures one of the Institution's medals, would be an admirable recognition of merit. The monetary reward, acceptable as that must always be, would only be part of the student's recompense. The knowledge that these things were noted and recognized at headquarters would have a profound influence. The spirit of emulation would be engendered, which would be extremely beneficial. The recognition must inevitably react in time on the status of the individual. Other qualifications being equal, the successful student would feel confident of promotion coming his way as opportunity offered. Human nature being what it is, the youth of grit and backbone would soon take care that he was not left behind. A tremendous fillip would thus be given to the demand for technical instruction, and all at a very moderate cost to the undertaking.

SOME QUESTIONS AND THEIR ANSWERS.

In discussing the question of facilities, two questions are often asked. First, what justification is there for gas undertakings granting the request, and, secondly, why such a request should be made now, when gas engineers who are at present occupying some of the highest administrative posts the industry has to offer, have, in their day, successfully gone through the mill? The answers to these questions are really very simple. From the administrators' point of view, the expenditure necessary is a form of investment which will bring in a return out of all proportion to the sum involved. Greater skill and knowledge would be available for dealing with all the details of works' routine; greater competence and interest in his work would be evoked from the student. It is the man who sees a reason for what he does, who is able to relate fact to fact, process with process, detail with general principle, who takes the most interest in his work. The interest, skill, and knowledge of the worker tends inevitably to better working, and so to the profit of the employer, in a thousand and one ways. Judged therefore merely by profit and loss considerations, the expenditure is a wise and justifiable one.

With regard to the second question, while the contention is undoubtedly true that many men now occupying high positions have successfully grappled with and overcome the difficult student times of their own day, it does not follow as a matter of course that the student of the present should, or can be expected to, fight his way through unaided. Times have changed. The business life of to-day in the gas industry is far more complex than it was a generation ago. An adequate knowledge of far more subjects is required of the gas engineer of to-day than was necessary in the past. The educational and technical standards are higher now

than they have ever been. It is a safe prediction to make that they will be higher still in the future. That future will probably make demands which are undreamed of to-day. The only way in which those demands can be adequately and satisfactorily met is by the highest possible technical training in the present of those who will have to grapple with future problems. That adequate training and preparation involves the covering of far more subjects than can be well taken in leisure time, and therefore provision for daytime instruction must be made.

The Problem of Teachers.

Now as to the dearth of teachers. It has, of course, never been suggested that officials occupying responsible posts should relinquish them in order to take up the teaching of gas subjects. The position in general terms is this. On the one hand, the best men for teaching are mostly in responsible office. Modern business life is exacting. Such leisure as is available is highly prized and very reluctantly relinquished. The result is a growing indisposition to accept the responsibilities incidental to the regular work, week in week out, throughout the busiest season of the year, of tuition in gas subjects. On the side of the technical institutes, too, there are difficulties. The number of students in any one centre must, even if generous facilities for study are afforded by undertakings, be rather small. There is usually only one gas undertaking in any one town, and that undertaking has not in most instances a sufficient number of the right type of men to make a big class. Even when neighbouring areas send on their quota of students, the number is still too small, from the institute's point of view. Consequently the institutes are precluded from offering adequate fees. In fact, in some cases, the sums offered are mere pittances, rather than fees. They are insufficient to tempt men to the necessary sacrifice of leisure and recreation, under the conditions of modern business life. If the fees payable were commensurate with the importance of the work done, instead of being limited by the number of students, a vast improvement would be made. Here, again, is an opportunity for the gas administrator to make a further contribution. The Birmingham Gas Committee pay the fees of their teachers, as shown in the scheme published last week. Why should not the gas undertakings concerned, either individually or collectively, make a small grant to approved teachers, in order greatly to increase, if not to double, the fees at present paid by the institutes? If the making of a grant involved difficulty for any reason, in particular cases, there are other ways of securing the same end. The man who sacrifices rest and recreation for the sake of the technical training of a succeeding generation deserves well of the industry; and it is fitting that those deserts should find material expression.

The Question of Centres.

With regard to "centres," it is impossible to speak with any certainty at the present moment. When considering this question in the first instance, two alternatives were open to the Advisory Committee. The first was to devise a series of gas courses for the different grades, which should be common to the whole country. In that case no cognisance would have been taken of local conditions, and no recognition made of possible local difficulties of compliance. In other words, it would have been a hard, inflexible scheme overriding all local considerations. There will be general agreement that any such course would have proved fatal even to the best laid scheme. Local technical authorities and principals of technical institutes would have resented it.

The second alternative was this. While giving definite indications as to what, in the opinion of the Committee, such courses should include, to ask the local technical authorities to devise their own schemes in such a way as would best suit local requirements and conditions, and work in with the least alteration to pre-existing programmes. Such schemes would utilize to the fullest the existing classes in the various general scientific subjects—such as chemistry, mechanics, physics, &c., and would not involve the appointment of special teachers or the arrangement of special classes in cognate subjects. This was the wiser course adopted by the Advisory Committee. One of the representatives of the Board of Education was asked by the Board to draw up a memorandum for the guidance of the local authorities; and this has been done. The memorandum is being printed, and will shortly be available for public circulation through H.M. Stationery Office. The schemes drawn up by the local authorities will be considered by the Advisory Committee at their meeting on Sept. 11, when it is hoped the first batch of approvals will be given.

In passing, it may be well to explain a phrase in the Institution's scheme which has given rise to some question. What is an approved technical institute? For the purposes of the education scheme, it is an institute which has drawn up a scheme for a gas course which has been approved by the Advisory Committee. The Education Scheme requires (section 1, clause 13) that "applications for the approval of schemes shall be submitted to the various Boards of Education—English, Scottish, and Irish—before Oct. 31 in any year. In order to facilitate the inauguration of the educational scheme, they have this year been asked to expedite matters, so that the local schemes should be received by Aug. 31. It is therefore impossible to give any information as to classes or centres until after the meeting of the Advisory Committee. Even then the list may be far from complete. The early steps in the inauguration of any new scheme, involving so many different bodies, are necessarily somewhat slow. But the industry may depend upon the fullest publicity being given at the earliest possible moment.

CITY AND GUILDS EXAMINATIONS PROGRAMME.

By the publication in the issues of the "Journal" for the 8th and 22nd inst. of this year's pass lists and prize winners respectively, thoughts will have been turned towards next year's City and Guilds of London Institute Examinations; and it will be helpful to prospective candidates to point out to them that there has just been published by John Murray, of Albemarle Street, W., at the price of 3s. 6d. net (postage extra), the programme for the session 1923-24, which contains general regulations and syllabuses for examinations in technological subjects. Copies of the programme are obtainable through Messrs. Lamley & Co., Nos. 1 to 5, Exhibition Road, S.W., or any bookseller. All inquiries relating to the work of the Department should be addressed to the Superintendent, Department of Technology, City and Guilds of London Institute, No. 29, Roland Gardens, London, S.W.

As compared with previous ones, the new programme does not contain a great number of alterations. In the first place, some increase has been made in the fees for Grade I. and Grade II. examinations; and another thing is that, in connection with the final examination in Gas Fitting, work on the district has to be inspected on behalf of each candidate. The names of members of the Advisory Committees appear; and, in addition, the Institute again state that they are able to avail themselves of the advice of various bodies, including the Council of the Institution of Gas Engineers. Mr. Charles Hunt remains an Honorary Consultative Examiner in connection with Gas Manufacture. The Examiners for 1923-24 in the subjects in which our readers are specially interested are: Coke and Bye-Products Manufacture, Mr. C. P. Finn; Coal-Tar Distillation and Crude Intermediate Products, Mr. W. H. Coleman; Gas Engineering, Mr. S. Tagg; Gas Supply, Mr. H. Kendrick; Gas Fitting, Mr. R. J. Rogers; and Heating and Ventilating Engineering, Mr. A. H. Barker.

The following are the dates of next year's examinations: Coke and Bye-Products Manufacture, Wednesday, April 30; Coal-Tar Distillation and Crude Intermediate Products, written, Thursday, May 1, and final (practical), Saturday, May 3; Gas Engineering, Saturday, May 10; Gas Supply, Saturday, May 3; Gas Fitting, written, Monday, May 5, Grade II. and final, *viva voce*, Saturday, May 17, Grade II. and final, practical, Saturday, May 17; Heating and Ventilating Engineering, Grade I., Friday, May 2, Grade II. and final, Wednesday, April 30. Following the syllabus for each examination, candidates will find a list of text books and works of reference bearing upon the subject of the examination, as well as the names of appropriate periodicals. They will also doubtless derive benefit from a careful study of the questions set for this year's examinations in the various subjects, which were given in the "Journal" for May 9 (p. 362), and July 11 (p. 270).

Among the special prizes, the Society of British Gas Industries again offer £5 5s. and £2 2s. for the first and second candidates respectively at the final examination in Gas Engineering. Gas Supply, and Gas Fitting; and Messrs. Benn Bros., Ltd., offer as a prize a specially autographed copy of the latest edition of Meade's "Modern Gas-Works Practice," to the first candidates respectively at the Grade I. and final examination in Gas Engineering. Both these offers are conditional on the candidates being eligible under the regulations. The Institution of Heating and Ventilating Engineers award prizes in their special subjects. In addition to these, silver medals are offered by the City and Guilds of London Institute on the results of the final examination, and bronze medals on the results of the examination in the grade next below the final, in all technological subjects.

Coke Recovery.

Concluding an extensive survey of processes of coke recovery, which constituted his paper before the Société Technique de l'Industrie du Gaz en France at their annual meeting, M. Mougin, the Engineer to the Central Coke Committee, maintained that the majority of gas undertakings had no cause to seek for complicated machinery; even hand-worked processes could show excellent results. He pointed out that a works carbonizing some 50,000 tonnes of coal a year—producing, that is to say, about 50,000 cub.m. of gas a day—will not have to deal with more than 8 tonnes of pan-ash per working day. This meant full-time work for two men on a small sorting machine, or two or three days a week with a more elaborate appliance. "Can it be said," asked the author, "that the problem is not worth studying? Far from this, it is a matter which should be taken up by the management of every works; and the following figures lend support to the postulation: Coke separation means 5 p.ct. more coke for sale; and if all the gas-works of France practised it, over 100,000 tonnes of fuel per annum could be recovered."

The Manchester and District Junior Gas Association have arranged an outing to Chester on Sept. 8. Ladies are specially invited to attend this meeting; and members and friends are requested to assemble at Chester Station at 3 o'clock. Tea will be arranged for at Iron Bridge, to which place it is intended to proceed by boat up the River Dee.

CHEMICAL TOPICS FROM CURRENT LITERATURE.

Monthly Notes from Recent Technical Publications.

By H. J. HAILSTONE, F.C.S. (Rochdale).

LABORATORY FURNACES.

Messrs. Gallenkamp's illustrated catalogues are always of interest; and one dealing with electric furnaces (No. 75B) is no exception. Two items of particular use to the gas-works chemist are a muffle furnace for the rapid estimation of ash in coals, and a furnace for conducting the Lessing coking test. The former furnace has doors at each end; and the coal sample is only gently heated when first introduced into the muffle. The volatile matter is driven off at a low temperature (with avoidance of coking) and is then moved into the hotter zone, where all combustible matter is burned away. On completion, the dish of ash is withdrawn through the door at the back on to a shielded tray, where it cools without danger of loss through draught. This apparatus has been designed with a view to carrying out a large number of tests with expedition.

ETHYLENE ABSORPTION.

The conditions of absorption of ethylene by strong sulphuric acid have been studied by H. Tropsch and A. V. Philippovisch (Brennstoff Chemie), who have employed mixtures of ethylene and propylene, which were treated with acid of various strengths in an absorption vessel filled with glass marbles. With acid of 87 p.ct. strength ten minutes sufficed to remove all the propylene. Very little ethylene was absorbed at this strength, whereas with stronger acid absorption took place. It was found that small amounts of benzene vapour were completely removed with this acid, though the absorption of larger quantities was incomplete. In the same publication there appears another paper on the same topic, from a different point of view. W. Traube and R. Justh find that chlorosulphonic acid may with advantage replace fuming sulphuric acid in the absorption of large quantities of ethylene. A stream of gas containing 7 p.ct. of this constituent was passed at the quick rate of one litre per minute, 90 p.ct. of the ethylene being removed by a mixture of chlorosulphonic and sulphuric acids, thus indicating how rapidly this reagent will act.

SULPHUR IN BENZOLE.

A method for estimating the free sulphur in motor fuels is recommended by Dr. Ormandy and Mr. Craven in the Journal of the Institute of Petroleum Technologists. The method consists of shaking the liquid in a stoppered bottle with about 3 p.ct. by volume of mercury. This is continued until the mercury coagulates. Dilute hydrochloric acid is added to the mixture, which is well shaken and then filtered through wet asbestos. After transfer to a beaker, a little hydrochloric acid and some potassium chlorate are added, and heat is applied to ensure that all the sulphide is converted to sulphate. After filtration, the filtrate is precipitated with barium chloride, and the percentage of sulphur ascertained in the usual way. By this method, the writers found certain samples of British benzole contained 1 milligramme of free sulphur per 100 cub. cm. Quantities in excess of this figure could be detected during a distillation by suspending a strip of pure copper foil in the neck of the flask, blackening being noticeable in the presence of more than 1 milligramme per 100 cub. cm.

PURITY OF LIQUIDS.

As a general rule the mutual solubility of two partially miscible liquids increases with rise of temperature, and often a critical point is reached when complete miscibility occurs. The presence of even small quantities of a third substance generally has considerable effect on this critical solution temperature. The application of these phenomena as a means of determining the purity of various materials has been investigated by D. C. Jones, whose papers published in the "Transactions" of the Chemical Society give an interesting account of the work done. Working with pure acetic acids of known strengths, the effect of the addition of a definite proportion of a partially miscible liquid was determined, as was also the further effect of an additional substance. As an example, it was found that, working with acetic acid of M.Pt. 15·3° C., the presence of 1 p.ct. of sulphur in pure carbon bisulphide increased the temperature of complete miscibility of the two liquids by 4·7° C.; and by this method the amount of sulphur could be estimated to within 0·02 p.ct. Benzene, on the other hand, lowered the critical point of carbon bisulphide and acetic acid 1·5° C. for each 1 p.ct. present. The effect of the presence of traces of thiophene in benzene has been observed in this connection; and it is demonstrated that by this method the purity of many liquids—benzene, toluene, aniline, &c.—can be conveniently ascertained after the necessary preliminary data have been secured.

DETERMINATION OF SULPHATES.

The methods of determining sulphur in various materials have been examined by Mr. J. M. Taylor, who has charge of the United Alkali Company's central laboratory at Widnes; and the details given in a paper before the Liverpool section of the Society of Chemical Industry show that the precipitation of barium sulphate must be conducted under suitable conditions if accurate results are required. In order to obviate the possibility of the precipitated barium sulphate being contaminated with alkali sulphates or barium chloride, thus giving rise to erroneous results, it appears advisable to form the precipitate by the simultaneous addition, drop by drop, of the separate sulphate and barium chloride solutions to boiling water containing hydrochloric acid. This practice ensures dense precipitates which are easily dealt with on the filter.

WATER IN TAR AND OIL.

An ingenious apparatus for the determination of water in tar, &c., is described in "Gas- und Wasserfach" by R. Mezger. It consists of a flask, reflux condenser, and burette receiver. The tar is heated with a quantity of xylole or naphtha in the flask, and the vapours ascend to the condenser through a covered tube. After condensation, the mixture of water and xylole passes into a burette, which acts as a divider and allows the xylole to return to the flask, while the water remains in the burette. Distillation is continued until no more water accumulates, as indicated by the burette reading. After running off the water, the flask is recharged for the next test. Another device which works in a somewhat similar fashion is the arrangement given by E. Liese in "Chemiker Zeitung." The vapours of xylole and water issuing from the boiling flask pass into the enlarged top portion of a graduated tube, and ascend the reflux condenser. The condensed liquids drop back to the tube, and the water settles-out in the graduated portion, while the xylole returns to the flask through the wide vapour tube.

LUBRICANT TESTING.

The selection of suitable lubricating oils is very often based upon a knowledge of such properties as the viscosity, flash point, free acidity, and specific gravity, which are considered, together with the price, when the purchase is to be made. None of these factors, however, gives a true idea of the value of an oil as a reducer of friction and wear under specific conditions. For a long time viscosity was considered to be of prime importance; but it has been shown by various workers that another property—that of "oilyness"—is of equal importance in eliminating friction. This property, which is quite independent of viscosity, is possessed in a greater degree by animal and vegetable oils than by mineral oils, and formerly was not easily measured. Research work on the problem showed that not only the oils used but the nature of the bearing surfaces has an influence on the friction between two surfaces. Exactly how the oilyness of an oil may be determined is described in a pamphlet issued by Messrs. J. H. Steward, Ltd., of No. 406, Strand, London, who are the sole manufacturers of the "Deeley" friction machine. The machine provides a means of delicately measuring the amount of power required to overcome the friction between two members moistened with the oil under test. Provision is made for applying loads up to 100 lbs. per square inch; and the static coefficient of friction is obtained by the use of a factor. This coefficient appears to be unaffected by the load, but is subject to variation through temperature changes. References to a number of researches on lubrication problems, and many interesting points in the study of lubricants, appear in the pamphlet.

Pitch as a Fuel.

Reference is made by Mr. Wilbert J. Huff, of the Koppers Company Laboratories, Mellon Institute, Pittsburgh, in a contribution to "Industrial and Engineering Chemistry," to the use of powdered pitch as a fuel. To burn pitch in solid form, he says, it may either be coked and fired on ordinary grates or it may be sub-divided and blown in with the air blast, somewhat as in the burning of powdered coal. The pulverizing of pitch may present some difficulty; and to eliminate any trouble, one method is to melt the pitch, divide it into drops, and allow them to fall into a cooling medium. A process has lately been developed by Mr. E. W. Clarke whereby pitch having a melting point of 82° C., or higher, is powdered with impact pulverizers, just before reaching the furnace—the velocity and direction of the air blast preventing any appreciable sticking. The furnace settings are the same as those for powdered coal; but the burners successfully employed are of a special type. Pitches of very high melting points may be coked, yielding a solid fuel possessing all the advantages of coke from coal, and in addition certain others derived from its low ash content. As a matter of fact, a quantity of this pitch coke is being made in beehive ovens. Contamination from the refractories of the oven is avoided in a process which has been developed in the course of co-operative researches conducted by the Koppers Company, the Aluminium Company of America, and the American Tar Products Company. This process and the apparatus employing it have been in successful operation by the last-named Company, and are the subject of patents owned by them.

Gas Working Modestly.—Studying the history of the development of gas, remarks Mr. B. C. Forbes, one notices that gas companies were very active in making known its advantages when its newness rendered active selling a necessity. But once the first line trenches were won, and momentum gained, *per capita* consumption increased, and the immediate necessity for intensive selling was gone. Yet to-day, with modesty amounting almost to silence, gas is doing more spectacular and more necessary work than was ever dreamed of in all the hundred years that it has been in use. Gas has progressed from a luxury to a staple; its cost to consumers has been reduced again and again; and its uses have at the same time been multiplied.

WALES AND MONMOUTHSHIRE JUNIOR GAS ASSOCIATION.

Annual Meeting at Newport.

The Annual Meeting of the Wales and Monmouthshire Junior Gas Association was held at Newport on Saturday last; a large number of members being present.

Visit to the Newport Gas-Works.

Under the guidance of Messrs. T. A. Canning and C. B. Felton, the party visited the Newport Gas-Works at Crindau, where they inspected the retort-houses, exhauster-house, and electric power plant. The company also saw the railway sidings adjoining the works, where all the coal for carbonization is received, and also viewed the machine shops, fitting-shops, motor-houses and stores, and made an exhaustive survey of the carburetted water-gas plant. The party next visited the laboratory, where the coal analyses are carried out on a considerable scale, as also analyses of gas liquor, gas tar, and other bye products.

Tea and Vote of Thanks.

The visitors were subsequently entertained to tea at the offices of the Newport Gas Company by the Directors.

Mr. J. H. Canning was unfortunately unable to be present owing to indisposition, but sent a message of regret for his absence. In this he said he had hoped to have been present and to have extended personally a welcome from the Directors of the Company. They desired him to express the pleasure it gave them to have the Association at Newport and to wish them every success. He trusted they would have a pleasant and profitable meeting, and hoped that on the Association's next visit to Newport he would have the pleasure of participating in their proceedings.

On the motion of Mr. T. B. Armitage, seconded by Mr. J. B. James, a vote of thanks was accorded the Directors of the Newport Gas Company for their hospitality. A message of sympathy with Mr. J. H. Canning was cordially passed, on the motion of Mr. B. J. Bell.

The Business Meeting.

Mr. T. B. Armitage (the retiring President) presided at the meeting which followed.

The Secretary (Mr. B. J. Bell) read apologies from Messrs George Clarry (Cardiff), Octavius Thomas (Pentre), James E. Kensole (Merthyr), Barton Grainger (Caerphilly), and T. Knowle (Cardiff).

Induction of the New President.

The Chairman, in introducing the new President, said he bore an honoured name. There was not a member of the Association who was better fitted for the position than Mr. T. A. Canning, who had taken a great interest in the work of the Association.

Mr. Armitage then vacated the chair, and Mr. T. A. Canning took his place.

The President, after expressing thanks for his election, proposed a vote of thanks to the retiring President, and paid a high tribute to the good work he had done for the Association. He had had a most successful year of office.

Mr. B. J. Bell, in seconding, remarked that Mr. Armitage had laid a good foundation for the Association.

The resolution was carried unanimously; and Mr. Armitage briefly returned thanks.

The President then delivered the following

PRESIDENTIAL ADDRESS.

Our newly-formed Association has made a most successfu commencement; and each and every one of us should feel proud and abundantly satisfied with our first year's work. But a very great deal still remains to be done. One of the first things we must strive to achieve is to increase our membership; and I would particularly appeal to each member to use his best endeavours to enrol new members. I feel that it is the dearest wish of us all to see our Association second to none in the country. We must aim at increased membership, and we must also try to enrol men who ought to belong to the Association, but who, up to the present, have not joined. On looking through the membership lists of other junior associations, we find the names of assistant engineers and managers, distribution superintendents, and the general staff of gas undertakings. In this respect our Association is not complete; and I would ask these gentlemen to join us, and so raise our status and influence.

EDUCATION SCHEME.

A short while ago many of you had the privilege of listening to Mr. Walter Hole's lecture on the Education Scheme for the gas industry; and I believe that you were favourably impressed by the masterly outline he gave, and the lucid explanations and answers he accorded your questions. I do not intend to dwell at any length on the scheme, and I shall confine my remarks to a few generalizations. In the first place, the scheme is an excellent one. There can be no possible doubt of this, and any one who is able to take advantage of it should do so without delay. In the second place, it caters for each and every one of us, and is so drafted that very few, if any, can say that it is inapplicable to their own cases. Thirdly, it ensures that all who are to hold responsible positions in the industry in the future will be properly trained and certificated. This is a great point, as hitherto this safeguard has been to a certain degree non-existent. A fourth point which occurs to me is in connection with the examination for the Diploma. Possession of the Diploma will no doubt be regarded as the hall-mark of a sound training in the particular branch or branches indicated thereon. I most certainly think that the Diploma in Gas Engineering or Gas Supply, or both, should qualify for membership of the Institution of Gas Engineers, provided that the general training and experience of the candidate is adequate. This opinion has been voiced before; and if the Diploma is to be of real value to its holders, it is only a fair one. If this concession is granted, I am confident that it will give a tremendous impetus to the Education Scheme, and will encourage the juniors of the industry to devote their energies and endeavours to the gaining of the Diploma. I would ask our Association as a whole to support this most excellent scheme, and to show by their whole-hearted and sustained interest a real live concern for its welfare.

THE THERM.

I hesitate to reopen the controversy that ranged for so many months over the therm; but it must be a matter of great satisfaction to us all that this unit, which has for so long been under a cloud, and unmercifully criticized, has now been completely vindicated by the Departmental Committee of the Board of Trade. In the Report of the Committee appear several statements which I consider comprise a final answer to, and condemnation of, the opponents of the therm, who, to put the matter briefly, expressed criticisms which were both distorted by ignorance and exaggerated by passion. Paragraph 2 of the Report contains the following:

> It was evident that many of the witnesses and correspondents were under an entire misconception with regard to the reason for charging for gas on the basis of its heating properties, and with regard to the nature of the therm.

This in itself is a damning statement. It has been fairly patent to us who are engaged in the industry that certain misguided persons, desirous of getting a "dig" at gas undertakings in general, stirred up an agitation against the therm by placing the onus of their heavier gas bills on the new unit. I unhesitatingly say that our critics did not, or would not, understand the therm, and had no intention of trying to comprehend it. If they had done so they would not have made such grievous blunders and misstatements, which to the scientific mind were apparent. Because a handful of gas consumers wrote letters to the Press, complaining of higher gas bills, the inference was immediately drawn, without any forethought or investigation, that gas bills in the country generally were higher, and that the therm was to blame. What a great deal of time and trouble, not to mention money, could have been saved by the use of a little judicious and unbiassed common sense! Gas bills were higher in a few isolated cases for the simple reason that the consumers had, for various reasons, used more gas; but as the advent of the therm coincided with the increased bill, it was regarded as responsible.

Reverting again to the Report of the Departmental Committee, we find in paragraphs 11 and 12 the following:

> It was clear that a continuance of the method of charge on a cubic feet basis with varying standards of quality would make it impossible for the consumer to be satisfied that he was getting value for his money. . . . The new system proposed ensured that only really useful gas should be paid for, and that other ingredients which might for any reason be present could not be charged to the consumer.

And yet again in paragraph 25:

> The method of charging for gas according to the number of heat units or therms supplied, entirely removes any temptation there may previously have been for a manufacturer of gas to dilute his product with valueless incombustible gases. Under the therm basis of charge the consumer pays only for the useful gas he receives.

We find in paragraph 29:

> The evidence available to us was to the effect that, over a wide range of calorific values, the heat value to the consumer of a therm is substantially the same. . . .

This, to my mind, effectually disposes of the suggestion that there should be one standard declared value for gas throughout the country. I cannot leave the subject of the therm without drawing your attention to some of the matter contained in paragraphs 56 to 59. This is as follows:

> We have heard evidence with regard to the thermal method of charging for gas from various corporate bodies representing both private and industrial consumers of that commodity both in London and the provinces, and also evidence from certain private consumers with regard to increases in their gas accounts. We were unable to ascertain, however, that there was any responsible body of opinion from among those who appeared before us opposed to the charge for gas being made on a basis of the heat units supplied. . . . The London County Council intimated that they raised no objection to the therm as such, and had no reason to attribute the increased amount of gas bills to the change in the method of charging from a volume to a heat basis. It appeared to be generally recognized that the method of charging according to the heating value of the gas is in the best interests of the consumer. . . . As the gas supplied by the Metropolitan Gas Companies was the same immediately after the introduction of the therm system as when gas was charged on the cubic feet basis, the method of charge cannot possibly be relevant to the increased consumption in cubic feet. . . . In this connection it may be pointed out that it is rather the total consumption by the public

than that of individual consumers which should be compared with previous records. Following this method, we have been furnished with evidence that the total make of gas by the largest of the three Metropolitan gas undertakings, was in the June half of the year 1922 only about 7 p.ct. higher than in the first half of the year 1921, and in the case of the smallest of the three companies the average receipts from consumers were less in the quarter ended in June, 1922, than in that ended in June, 1921. It is evident, therefore, that the consumption of gas among consumers in the Metropolitan area has not on the whole seriously increased. . . . The small total increase in consumption in the Metropolis may be explained without difficulty when it is remembered that the first half of the year 1921 included a three months' coal strike, when gas consumption was necessarily cut down as much as possible, and also that the warm spring of the year 1921 necessitated less gas consumption for heating purposes than in the corresponding period of the year 1922.

We find in paragraph 63:

> It was an unfortunate coincidence, for which the gas companies concerned were hardly to blame, that in the case of two of the Metropolitan undertakings the change from a volume to a therm basis of charging came into operation at a time when the price of gas per thousand cubic feet had reached its zenith.

I trust that I have not unduly wearied you with these extracts from the Report of the Departmental Committee of the Board of Trade, which comprise a fitting and conclusive reply to the many charges levelled against the therm, and clearly show that the allegations were groundless. I think that you will agree with me that any further comment would be superfluous. The conclusion drawn by the Committee, which I set out below, is only a fair and correct inference.

> After careful consideration of all the evidence available, we are unanimously of the opinion that the method of charging for gas on the basis of its heating properties—*i.e.*, by the therm—is the best safeguard of the consumer.
>
> It is abundantly clear that the system of measurement by the therm, as such, can in no way affect the price, composition, quality, pressure, or supply of gas. It is a mere method of measurement, and has, and can have, no active results.

The Report has done us justice; but it would be more satisfactory if, at the same time, the therm had been made a Board of Trade unit, and thus placed on a level with the electrical unit. We now, at long last, possess a unit which enables our product to be compared with electricity; but until our unit is fully recognized by the Board of Trade, we shall not experience the satisfaction which is our due.

SCIENTIFIC CONTROL.

The gas engineer of to-day is in a far happier position than his predecessor of even twenty years ago, when a gas-works was, for the most part, run on "rule-of-thumb" methods. Nowadays the engineer and his assistants have invaluable methods of science to aid them. I refer to the use of gas-works recorders and other scientific instruments. We have to-day, to mention only a few, vastly improved calorimeters, analysis apparatus, pyrometers, recording pressure gauges, and, what is more, apparatus which was almost undreamed-of twenty years ago, such as recording calorimeters, CO_2 and specific gravity recorders—not to mention a host of other kindred appliances. Hence the gas engineer of to-day is in a position to have all his data at hand, and can check his working at a moment's notice. He can ascertain exactly what his results have been, night and day; he can obtain a continuous record of the heats in the regenerative furnaces, of the CO_2 content of the gas, of the specific gravity and calorific power of the gas he is making or supplying; he can obtain accurate analyses of the same gas. This, in itself, is a great advantage, and is of untold value as a time, money, and labour saving adjunct. The increased efficiency of the gas industry taken as a whole is due in no small degree to scientific control. Problems that were the bane of gas engineers years ago are now solved in a few moments by referring to the data collected day by day. Scientific control is a road to the Elysian fields; but there is one danger always to be guarded against—the risk of over-confidence. Do not allow your scientific instruments to be your sole guide in the running of your works. Your instruments may fail you, they may cease to register correctly; you cannot check and test them too often. It is sheer folly to fall into the snare of over-confidence; employ good sound common sense as well, and check all your results with the greatest care.

FLAME TEMPERATURE.

As I have already pointed out in the course of the discussion on a paper I had the pleasure and privilege of delivering to you previously, the problem of flame temperature is an abstruse one. Flame temperature and calorific power depend upon the composition of the gas used; increased percentages of carbon dioxide or nitrogen mean decreased calorific value and flame temperature. It must also be borne in mind that the flame temperature of a gas differs very considerably at varying portions of the flame. I have endeavoured to discover if there is any relationship between the flame temperature and the calorific power of a given gas; and working on the lines adopted by Bain and Batten, I obtained a series of conflicting results which has served to impress upon me the extreme difficulty of defining any set laws concerning flame temperature. A given bunsen burner with a constant gas and air supply was used, and the flame temperature was always taken at the same point of the flame, preferably at the highest point thereof; my object being to find if the flame temperature varied in proportion with any change in calorific power. As I have said, my results were contradictory. Experimental work on flame temperature is still being undertaken in various directions; and the data obtained will possibly lead to a solution of many of the problems which have still to be investigated. So much depends upon accurate knowledge in this connection that it is most important that definite conclusions should be sought, in order that appliances, particularly on the industrial side of our business, should be worked with efficiency. We are still working in the dark, however; and the flame temperature problem is complex and difficult, and will prove a fruitful field for further scientific study.

COAL ASSAYS.

I should like to say a few words on coal assays and methods adopted for testing coals. In my opinion, the laboratory method is a guide, but only a guide, to the true nature of a coal. I would suggest that, to obtain a good working test, distillation should be carried out on a larger scale than is practicable under laboratory conditions, and with appreciable quantities of coal. With regard to tests for ash content, volatile matter, sulphur, &c., I hold that, if the laboratory method is employed, several tests should be made, and an average taken. A thorough knowledge of coals and their properties is more essential to-day than ever; and it is our duty to ensure that these tests are accurate and as far as possible a correct index of the nature of the coals.

THE FUTURE OF GAS LIGHTING.

I am an optimist and a firm believer in a great future for gas lighting. When we consider that gas can offer the safest, healthiest, most-dependable, and most economical high-grade service in the lighting department, it is hard to believe that there are those who openly state that it is their belief that lighting by gas is a thing of the past. I have the greatest confidence in the future of gas as a lighting agent; and it follows that I am equally convinced that gas is second to none. These are no empty words, but the outcome of considerable experience in dealing with the facts of the case. Gas lighting is not a thing of the past, its possibilities are greater to-day than ever before. I am convinced that the present fashion for fitting up houses, new and old, with electrical equipment, is the outcome of a hankering after novelty. Electricity is a comparatively new lighting agent, and the public, being human beings, like to try anything new. But the greatest lovers of novelty tire of the new, and go back to that which gives the best service and most in the way of real value for money. Gas is undoubtedly the superior of electricity as regards lighting, if looked at from the point of view of health alone. Good eyesight is a most valued possession; users of gas for lighting are adopting the best method of safeguarding their eyesight. We are constantly having it thrown in our faces that, though gas lighting may be cheaper, more dependable, and healthier than electric light, it is not so convenient, as electric light can be switched on in a moment. I would remind those who are continually harping upon this subject that gas can be switched on just as conveniently as electric light. At the same time I would suggest to the makers of gas switches that the price of their product is too high to ensure a ready sale. A reduction in price is all that is needed to secure a big demand for these useful adjuncts to an up-to-date installation of gas lighting. The present price of the gas switch is impeding the progress of gas lighting very seriously. If the manufacturers place on the market a thoroughly efficient and up-to-date switch, it will certainly lead to their wide adoption, with consequent advantage to the manufacturers and to the gas industry. At the present price, it cannot be expected that the public will adopt the gas switch as extensively as its merits deserve. If the manufacturers of gas burners, brackets, pendants, mantles, and the like will also realize and appreciate their obligations and duties, and produce a high-class, well-finished, durable, inexpensive, and attractive article—there should be beauty and art in all forms of lighting—we shall go ahead. We can also help by aiding our consumers to understand the regulation of, and attention to, gas-burners. It is impossible, also, to exaggerate the vital importance of establishing an efficient system of maintenance of gas-burners of all descriptions. If we all pull together and help one another, there is not a great deal to fear; and given this, my confidence in the future of gas lighting is unshaken.

SALESMANSHIP.

I confess that in dealing with salesmanship I do so with some trepidation and uneasiness of mind. I am not at all certain that it is within the sphere of our Association to deal with salesmanship; but I am going to take the risk of mortally offending our salesmen's circle by making a reference to their range of activity. I have felt, however, that it is only fitting that I should make some allusion to salesmanship, particularly as we have quite a number of salesmen members of our Association. I should like, in the first place, to congratulate them upon the excellent beginning they have made, and to wish them all success in the future. The formation of salesmen's circles has given a new aspect to this side of our industry in South Wales; and I am confident that it has conduced to increased sales of gas-appliances.

I would enumerate three points which I consider are essential to successful salesmanship, treating the matter in a broad way:

1. Courtesy and tact.
2. Demonstration.
3. Advertisement.

First and foremost I have placed courtesy and tact, as willing-

ness to help and explain, blended with a little judicious perception in seeing and doing what is best in varying circumstances, is one of the greatest aids to successful salesmanship. Demonstration occupies second place, and really goes hand-in-hand with courtesy; it is another essential. Show your prospective customers exactly what the different types of gas-apparatus will do, and impress upon them the advantages held by any particular type over any other pattern, and thus interest prospective buyers. It may be pointed out, however, that adequate demonstration cannot be given unless one has a really practical knowledge of the principles underlying the design and construction of gas-apparatus. The new Education Scheme, previously referred to, will be productive of inestimable advantages in this respect. Advertisement occupies third place. Advertise, and so bring people to your showrooms. Once they are through the door, I think the rest can be safely left to the salesman. Do not hide your light under a bushel—bring it out into the open. Gas undertakings, until lately, have held themselves too much in the background; the days when procrastination was the rule have now passed, and we are faced by very live competition. Let us, one and all, advertise our goods and their good qualities. Hitherto we have been content to allow our alleged bad qualities to be dragged out into the limelight; but the time is now over-ripe for our real and undoubted virtues to be extolled. Others will not extol them, so we must throw aside the cloak of modesty and "blow our own trumpets." Advertisement is one of the most powerful agents we possess towards successful salesmanship. Never forget that increased sales of gas-appliances mean increased sales of gas.

"B.C.G.A."

I cannot refer in too high terms to the work of that admirable body the British Commercial Gas Association. The Association is doing a great amount of useful and valuable work; and it is the duty of all gas undertakings to rally round them and show their interest by taking an active part in the work. I would particularly appeal to those undertakings who have not yet joined the "B.C.G.A.," and who are, to put the matter very mildly, "reaping where they have not sown." It is hardly fair, and still less indicative of the spirit of the nation to which we are proud to belong, to stand aside and let others pay and work for a benefit which applies equally to all. It is nothing less than aping the habit of the cuckoo, who, as we are aware, allows other birds to hatch her eggs. The "B.C.G.A." is strong to-day, but it will be stronger in the future if the undertakings who are not yet in membership will realize their responsibilities and duties and show, by joining at once, that their interest is not dead.

While I am dealing with the "B.C.G.A.," it might be opportune to make some passing reference to the National Gas Exhibition, which is being held at Bingley Hall, Birmingham, from Sept. 17 to Oct. 3. As you already may have heard, it is proposed to hold joint meetings of the junior gas associations and the salesmen's circles at some time during the first fortnight. It is the bounden duty of every one of the junior associations to encourage a representative attendance of the members under their control, in order that the joint meeting may prove an unqualified success, and reflect credit upon the associations concerned, while, at the same time, demonstrating their interest and enthusiasm. No doubt the number of members present from each association will be remarked and noted by the responsible body concerned, and will form a basis for favourable criticism—or the contrary. Our Association is a comparatively new one, and, up to the present, we hope that we have created nothing but favourable impressions; we have certainly secured favourable and encouraging comment. I should not care to see this happy promise "nipped in the bud" and destroyed through culpable negligence or want of forethought. Our Association should ensure that a fully representative contingent makes the visit to the Mecca, for the time, of the gas industry—to wit, Birmingham. The journey will not be a barren and fruitless one. I am convinced that you will return abundantly satisfied, and that what you have seen and heard will fructify and redound to your benefit and well-being in years to come, and will be productive of lasting benefit to our industry.

Mr. D. M. John (Aberdare), in proposing a vote of thanks to the President for his address, said he had put a tremendous amount of thought into it.

Mr. A. H. Shepherd (Swansea) seconded the motion, which was carried heartily; and the President briefly responded.

Discussion.

Mr. J. Mogford (Briton Ferry) congratulated the President on his address. He had ably dealt with subjects which were before all gas engineers to-day. The President's father and grandfather were very well known in the gas industry, and he was worthily following in the steps of his sires. It was their duty to take advantage of their present-day opportunities. The gas industry wanted more blowing of trumpets nowadays. Coal must be carbonized if it was to be preserved. The therm had come to the rescue of the gas industry after it had been well-nigh ruined by the war. They wanted push and go, as well as optimism, to ensure the future of the gas industry. The best field of future gas supplies was to the cottager. They ought to hold the field for lighting and cooking in every town in England.

Mr. D. Muir (Pontypridd) eulogized the educational scheme. If the President could make any discoveries on the question of flame temperature he would add fame to the name of Canning. Faulty fittings often gave gas a bad name; and he considered it would pay all gas undertakings to instal free fittings into the houses of all their employees. It would be an excellent advertisement.

Mr. A. H. Shepherd (Swansea) said he was a great believer in newspaper advertising. In all their advertisements the word "Gas" should be the centre word, and everything else should be grouped round it. He instanced a case where he had succeeded in getting an education authority in South Wales to revert to gas in place of the electric light in the schools.

Mr. J. B. James (Cardiff) made a strong appeal for new members.

Mr. B. J. Bell said that the granting of diplomas would create a status for gas officials which would do a great deal of good. He believed in research, for they must know the capabilities of their product. Another point was the payment of the salesmen. Ridiculous wages were being offered; and he considered they would not get capable salesmen unless they paid them a good salary.

Mr. T. A. Canning, in reply to the discussion, agreed that they would largely look to the cottages for the future of gas lighting. It would also be a good thing if every gasworker's house was a small showroom. He concluded by paying a tribute to Mr. Bell for his indefatigable work as Secretary, and said the Association owed a great debt to him.

PRIVATE OXYGEN PLANTS.

A short time ago, reference was made in these columns to an article in "Industrial Gases" which bore out the view that oxygen must be produced on a large scale to realize a sufficiently cheap price to make it available for utilization in any oxygen-steam system for the manufacture of town gas. A private plant on a small scale for this purpose would not meet the requirements. Following this reference, a letter appeared in our "Correspondence" columns which suggested that small oxygen plants were available. The writer of that letter dissented from the views of "Industrial Gases," and asserted that practically every individual consumer of oxygen from about 25,000 c.ft. per week upwards could instal his own plant with very substantial savings to himself, which savings are the greater the further he is removed from the nearest existing oxygen plant. Our contemporary has been induced, by the publication of that letter, to return to the subject. It says that the writer is the agent for a firm manufacturing and exporting small oxygen plants, and that his argument appears to be the stock one of all agents for German plants. Our contemporary alludes to an actual case of a works, situated about fifty miles from the nearest oxygen factory, from which about 25,000 c.ft. of oxygen in cylinders are purchased per week. A German plant has been offered to the owner of these works, the capital expenditure for which would have been £5800, including £2000 for building alterations and foundations. The maker's estimate of the cost of oxygen in cylinders, including 2½ p.ct. depreciation per annum, was 23s. 6d. per 1000 c.ft.; so that 25,000 c.ft. of gas for fifty weeks (1,250,000 c.ft) would cost £1453 2s. 6d. The depreciation on motors, gasholder, cylinders, &c. (£1700 at 10 p.ct.), would amount to £170; depreciation on building and foundations (£2000) at 2½ p.ct., £50; and interest on the capital expenditure at 8 p.ct. per annum, £464. Thus the total cost would be £2137 2s. 6d. The present annual expenditure of these works for oxygen, buying from the factory fifty miles away (25,000 c.ft. per week for fifty weeks at 32s. 6d. in cylinders) is £2031 5s.; and the cost of transport at 12s. 6d. per 1000 c.ft., £781 5s.—together £2812 10s. With these bare figures, there is only a balance of £675 7s. 6d. in favour of the private plant, even with the cylinders under existing arrangements having to be conveyed fifty miles. Considering risks and responsibilities, the owner of the works in question is continuing to obtain oxygen in cylinders, and is "reserving his capital for a less hazardous investment." Our contemporary does not accept as correct the figures for the German plant. Anyway, whatever their value, oxygen at the prices mentioned would be of little use to the gas manufacturer. Mr. T. C. Finlayson, in his recent paper before the Institute of Chemical Engineers, showed that his exploration of the available processes had not revealed one which would produce oxygen at a price to enable it to be employed in the continuous gasification of coal. He was aiming at atmospheric oxygen of not less than 70 p.ct. purity at a cost not exceeding 1s. per 1000 c.ft.

The Power Hoe for Coal Removal.—Writing in the "Gas Age-Record" on the subject of the summer storage of coal for winter's use, Mr. Russell B. Williams says that a very simple and inexpensive way to handle stored coal is that of employing the power hoe or dragscraper. The coal may be received in railway wagons, and dumped into a portable belt conveyor, which discharges it to the initial pile alongside the railroad track. The hoe is removed to and fro by a steel cable, the ends of which are fastened to driving drums in the operator's house, which is so arranged as to give a clear view of the storage pile. The cable passes round sheaves so located as to serve the storage yard. Thus the hoe or dragscraper takes the coal away from the initial pile, placing it on the portion of the storage pile which can more easily bear additional tonnage. The empty hoe rides on top of the coal until it returns to the initial pile, and the cycle of operation is repeated. When reclaiming from storage, the hoe's attachment to the cable is reversed, thus moving the coal in the opposite direction.

MINISTRY OF LABOUR TRAINING DEPARTMENT.

The Industrial Training Department of the Ministry of Labour is concerned with the training of disabled ex-service men who, through disabilities contracted on active service, are unable to return to their pre-war occupations. It is the object of the Department to teach these men new trades in which they may become self-supporting citizens. In the task of reconstruction all trades have been asked to co-operate; and while men have not been trained specifically for the upkeep and repair of automatic gas-controllers, a large number of men have been trained in watch and clock repairing. Such men have proved by experience to be eminently suitable for employment by gas companies using these appliances.

The course of training in watch and clock repairing is an intensive one for a period of twelve months, followed by a six months' improvership in the workshop of an employer, at a wage of 25s. per week. During the whole period of training the man's pension is withdrawn, and he receives a weekly sum, equal to a 100 p.ct. disability pension, in addition to allowances for wife and children. From this there is deducted, during the improvership period, the amount paid by way of learner's wage.

There is still, however, a large number of men in all parts of the country waiting to be placed for the improvership period; and we have been asked to bring the position of these men to the notice of gas undertakings, and at the same time to draw attention to the suitability of the men for employment in the upkeep and maintenance of automatic gas-controllers. Upon application to the Secretary of the National Trade Advisory Committee, Gold, Silver, and Allied Trades, 1, Sanctuary Buildings, Great Smith Street, Westminster, S.W. 1, arrangements will immediately be made for an officer of the Department to wait upon any undertaking to explain the details of the scheme and elucidate any point which may be in doubt.

Wills.—Mr. William Chew, who was for many years the Blackpool Corporation Gas Engineer, and who died last April at the age of 67, left estate of the gross value of £45,916, with net personalty £27,418.

Educating the Public to the Value of Gas.—We have received a reprint of one of a series of articles prepared by Mr. P. S. Hoyte (the Engineer and Manager of the Plymouth and Stonehouse Gas Light and Coke Company), and published in the "Western Independent." It is an excellent example of what can be done to arouse the interest of the general public in the manufacture and use of gas. Already it will have driven from many minds ill-conceived notions regarding one of the greatest benefits of civilization; and there are no limits to the beneficial influence of inculcating sane notions regarding gas where previously biassed opinions have held sway. Collaboration with the local Press should be the aim of all gas undertakings; and the intrinsic merits of gas are such as to require no exaggeration in convincing the common weal of its true worth. The articles referred to in this paragraph are admirable in all respects, being written in an interesting manner and sufficiently free from technicalities as to be easily comprehended by those unversed in gas lore.

Eastern Counties Gas Managers' Association.—The half-yearly meeting of the Association will be held in London on Wednesday, Sept. 12. The proceedings will commence with an inspection of the Tottenham Works of the Tottenham District Light, Heat, and Power Company. Among points of special interest, there is now in progress of erection at these works a six and three-quarter million holder. Motor chars-a-bancs will leave Liverpool Street Station, en route for the works, after the arrival of the 10.30 train. After the inspection, members will be entertained to luncheon at the Holborn Restaurant on the invitation of the Chairman and Directors of the Company. Following this, the business meeting will be held, at which the retiring President, Mr. T. F. Canning, will take the Chair. The agenda includes a paper by Mr. H. C. Smith (Chief Engineer of the Company), entitled "Notes on Works' Cost," and one by Mr. J. R. Bradshaw (Engineer and Manager of the Retford Corporation Gas Department) on "Light, Heat, and Power—A Plea for a Broader Outlook." Tea will be served at the conclusion of the meeting.

Hydrogen Sulphide as an Industrial Poison.—In a report issued by the United States Bureau of Mines on this subject, it is pointed out that hydrogen sulphide is highly toxic, and that acute poisoning in men can be produced by concentration of 0·07 to 0·08 p.ct. of it. Acute poisoning by hydrogen sulphide acts on the central nervous system, resulting in a respiratory paralysis followed by cardiac failure and death. Sub-acute poisoning from the same cause is chiefly in the form of irritation of the respiratory tract and eyes, and depression of the central nervous system. Poisoning of the latter character can be produced by long exposures to concentrations as low as 0·005 p.ct.; and at autopsy these cases show signs of lung inflammation and dilatation of the heart. All working places should, bearing these facts in mind, be well ventilated. Canister masks, similar to those used by the army, hose masks, and self-contained oxygen-breathing apparatus, are of value in protecting those who must enter atmosphere containing hydrogen sulphide; but the canister mask will only protect against a moderate concentration of the gas. Victims of acute hydrogen-sulphide poisoning may be saved by immediate removal from the poisonous atmosphere and applying artificial respiration.

CORRESPONDENCE.

[*We are not responsible for opinions expressed by Correspondents.*]

Republishing an Ancient Advertisement and the Result.

SIR,—The following announcement, which was originally inserted in the "Sheffield Independent" one hundred years ago, on Aug. 23, 1823, was reproduced in the same newspaper as an interesting extract on Aug. 23 of this year.

Workmen Wanted.

"Smiths and stove grate fitters of sober habits should apply to Newton, Scott, Chambers & Co., Thorncliffe Ironworks, near Sheffield, where they will meet with liberal encouragement."

A number of replies were received at the works this morning; several of the applicants averring that they had "never touched beer in their lives."

Stove grates are still made here; but the majority of our smiths are engaged in our constructional steelwork department, and work, for the most part, on a material not discovered until many years after the above announcement.

For NEWTON, CHAMBERS & Co., Ltd.,
Richard Mills.

Messrs. Newton, Chambers & Co., Ltd.,
Thorncliffe Ironworks and Collieries, Sheffield,
Aug. 24, 1923.

REGISTER OF PATENTS.

Coils for Heat Transfer.—No. 201,206.

WILTON, T. O. & N., both of Hendon, N.W.; and THE CHEMICAL ENGINEERING AND WILTON'S PATENT FURNACE CO., LTD., of Victoria Street, S.W. 1.

No. 9199; March 30, 1922.

This invention relates to cast-iron coils as used in apparatus for distilling oils or tars, condensing plants, &c.

Integral with the coil is provided an internal spiral fin or groove which forces the liquid to follow a spiral path and make more intimate contact with the walls of the pipe. The gaseous constituents are conveyed to the centre of the pipe; and in condensers, where cold water flows within the coils, the heated water likewise gathers at the centre, leaving the cold water in contact with the walls.

It is pointed out that the spiral motion of the liquid increases the scouring action and thereby lessens the tendency to sedimentation—a particular point in tar distillation apparatus, where carbon is sometimes deposited on the internal surface of the coils.

Change-Giving Mechanism for Gas-Meters. No. 201,233.

MAJOR, P. F. E., of Shepherd's Bush, MILES, G. H., and SMITH, C. C., both of Twickenham.

No. 11,694; April 26, 1922.

No. 18,419; July 5, 1922.

This invention relates to coin-released gas on electricity meters, and provides an arrangement for obtaining change in (say) pennies for a coin of larger denomination (a shilling, say) inserted by the consumer.

The arrangement permits the insertion of the shilling into a slot in a hand-operated slide, which is then pushed inwards; and the edge of the coin acts on a lever, which, against the pull of a spring, removes a locking-bolt from a recess in a toothed wheel. As a result the latter, which has a ratchet periphery, is free to revolve, and is made to do so by a pawl arrangement carried on a hand slide. Into a recess in this slide the lowest penny has fallen; and twelve pennies may be removed by successive movements of the slide and pawl, when the recess in the toothed wheel again registers with the locking-bolt, and prevents further revolution.

At first the shilling is held up in a neutral position between the lever and the first-mentioned slide; but it is permitted to drop by the intervention of a coin-shaped projection on the wheel, which imparts further movement to the lever and so releases the coin.

A glazed opening is arranged in the coin tube, so that the number of pennies therein can be noted; and if these are insufficient to provide change for the shilling, as many as there are may be removed, the wheel remaining operable for each penny to be recovered as it passes through.

Cut-Out for High-Pressure Governors.—No. 201,357.

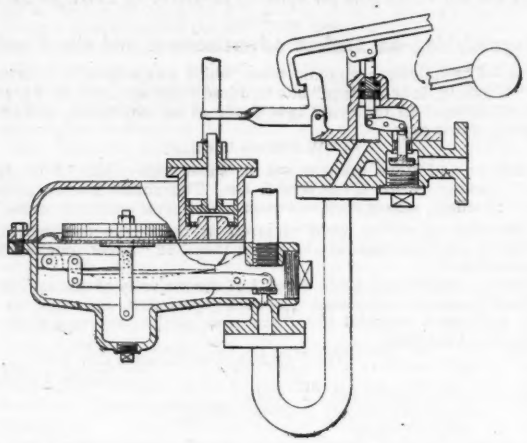
MITCHELL, E. A., of Cannon Street, E.C.

No. 17,156; June 21, 1922.

This invention relates to means for controlling the flow of fluid from one part of a system to another, involving the use of a pressure-reducing valve operating automatically. The object is to provide, particularly in high-pressure gas systems, for the effectual isolation of any portion of the system in which, by reason of unnatural conditions, the pressure at the consumption side of the governor valve is abnormally augmented.

This is achieved by arranging that the gas before it reaches the governor shall pass through a stop valve; this being held open by mechanical means until the pressure in the governor is so far increased as to displace a trip device. Thus, while the pressure-reducing valve is left free to function simply as a regulator, the isolation of a section

of the system, due to mishap—such as rupture of the pipe leading from the governor to the consumer, or failure of the pressure-reducing valve to close by reason of the presence of an obstruction, or disturbance of the normal conditions existing in the governor—is at once complete.



A Cut-Out Incorporated in High-Pressure Governing Apparatus.

We reproduce a sectional elevation of one form of the apparatus, which is seen to comprise a high-pressure valve (on the right), a pressure-reducing valve, a governor casing, and a cylindrical chamber containing a vertically movable liquid-sealed piston. The chamber is in communication with the side of the governor wherein the diaphragm is exposed to the pressure of the gas being consumed, and also, at the opposite side of the piston, with the external atmosphere and with the governor at the opposite side of the diaphragm. A loaded lever controlling the high-pressure inlet valve co-operates with a pivoted detent having one arm engaging the loaded lever and its other arm engaged by a rod projecting from the liquid-seal piston. The working of the apparatus will be clearly understood.

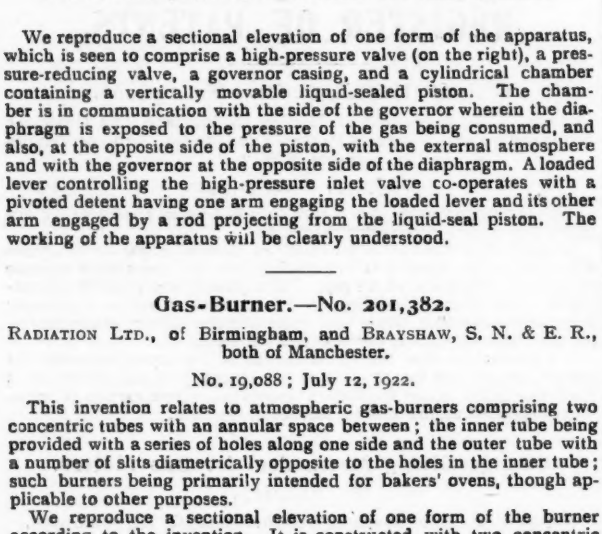
Gas-Burner.—No. 201,382.

RADIATION LTD., of Birmingham, and BRAYSHAW, S. N. & E. R., both of Manchester.

No. 19,088; July 12, 1922.

This invention relates to atmospheric gas-burners comprising two concentric tubes with an annular space between; the inner tube being provided with a series of holes along one side and the outer tube with a number of slits diametrically opposite to the holes in the inner tube; such burners being primarily intended for bakers' ovens, though applicable to other purposes.

We reproduce a sectional elevation of one form of the burner according to the invention. It is constructed with two concentric tubes—an inner distribution tube and an outer tube, with an annular space between them. The inlet end of the burner is fitted with a venturi throat, which may be screwed on to the inner distribution tube; and the outer tube may be attached by flanges on the tube and venturi throat respectively and bolts, so that the two tubes always retain the same relative position.



Bakers' Oven Burner by Messrs. Radiation, Ltd., and Brayshaw Furnaces and Tools, Ltd.

The inner distribution tube is drilled with a number of holes through which the gaseous mixture passes into the annular space; and the outer tube has cut in it a number of longitudinal slits through which the gaseous mixture passes for ignition. The holes and the slits are placed diametrically opposite, so that a good distribution of the mixed gases may take place. Distance-pieces, which may be small studs screwed into its periphery, are disposed spirally round the inner tube to maintain the tubes concentric under expansion and contraction.

The gas supply pipe is preferably fitted with a swivel joint and so fixed that the jet may be moved opposite to, or away from, the venturi throat, to permit of the burner being placed in position or removed from the oven without breaking any connections. The gas-jet may be fitted with studs or projections engaging in notches in a flange on the venturi throat, to ensure that the gas-jet shall be in correct position in relation to the burner before ignition takes place.

The specification also describes and illustrates a modification permitting of a "straight-on" flexible connection to the jet.

Gas-Furnaces.—No. 201,386.

CROSBIE, S., of Whetstone.

No. 19,283; March 16, 1923.

This invention relates to improvements in liquid or gaseous fuel furnaces of the kind in which the air is preheated by means of waste gases from the combustion chamber; the air to be heated being under pressure sufficient to promote circulation through the furnace plant, and being admitted to piping which traverses a chamber heated by the combustion products.

The invention consists in an arrangement which is particularly suitable for furnaces associated with glass-melting tanks; the specification describing a furnace of the above kind provided with two separate air-preheating chambers, one on either side of the furnace. These chambers are constructed independently of the furnace, and are arranged to communicate with the furnace combustion space, each by means of a number of short dampered flues in the side walls of the furnace. Such arrangement enables repairs to be readily carried out on the furnace itself or on either of the chambers without interference with adjacent parts, and also permits of easy regulation of the temperature locally within the furnace.

Gas-Generators.—No. 201,385.

WHITE, T. H., of Cwmbran, and WALKER, T. B., of Bristol.

No. 19,248; July 13, 1922.

This invention relates to generators for the production of water or producer gas; and its object is to permit the producer and converter portions of such generators to be of the most efficient relative areas, without regard to the area or capacity of the fuel supply shaft. Also the invention, for generators consuming coal as distinguished from coke, enables the coal supply to be kept clear of the influence of the heat of the generator until reaching the high-temperature portion of the generator, thus avoiding the formation of unstable vapours. With either coke or coal fuel, the invention enables a larger reserve of fuel to be provided; and therefore an increased interval can elapse without attending to the generator.

The producer or furnace portion of the generator is preferably rectangular in plan, with a rectangular grate. Superposed thereon is the fuel supply shaft or magazine. This is preferably also rectangular in plan and diverges downwards from a small feeding door at the top to the grate chamber. For coal, the bottom 6 in. or so is of greater slope than the remainder, in order to avoid the coal sticking up as it approaches the hot zone of the generator.

Alongside the magazine shaft, but separate therefrom, is a vertical shaft or tube occupied by a column of small coke, which is fed into this shaft from the top, but is prevented from dropping through a communicating passage leading from the producer or grate chamber. The CO_2 generated in the grate chamber, with any steam admitted below the grate, is drawn through the column of coke and converted into CO and water gas. With coal used as fuel, the converter shaft is still charged with coke, and the gas distilled from the coal as it approaches the high-temperature zone of the producer (which it eventually enters as coke) is fixed by passage through the heated coke in the converter shaft.

The converter shaft being filled with coke, but with the cover open, on commencing running with coal the fire is started on the grate before the magazine shaft is charged. After charging the latter with coal, it is sealed; but the cover of the converter column is left open until the coke therein has become heated by the products of combustion from the grate, under natural draught. The cover of the converter shaft is then also sealed, and the products of combustion are drawn through the converter shaft by a steam ejector or other means.

The relative areas of the grate and the converter shaft may with advantage be as much as 6 to 1; but this proportion would be departed from to suit various fuels.

Portable Apparatus for Gas Analysis.—No. 201,408.

MACDONALD, D. M., of Muswell Hill, N. 10.

No. 20,990; Aug. 1, 1922.

This patent covers a complete portable apparatus for the technical analysis of coal gas and like combustible gases; the long specification and seven drawings describing every detail of construction and the method of using the apparatus.

Broadly, the latter consists of a finely graduated burette connected by way of a branched capillary tube of very small bore with three absorption pipettes and one explosion pipette and also with the atmosphere. The whole is supported in a wooden case containing an accumulator and spark coil, and closed by sliding panels back and front, for the purpose of moving it about from place to place as required.

Unlike most gas-analysis apparatus of this type, the carbon monoxide content of the gas to be analyzed is not determined by the customary absorption in ammoniacal or acid cuprous chloride, but is exploded with excess of air, together with the methane and hydrogen, in the explosion pipette. The carbon dioxide formed is absorbed, and its volume noted. Finally the residual oxygen is absorbed in alkaline pyrogallol. Knowing the contraction on explosion, the carbon dioxide formed, the oxygen taken, and the oxygen left, the carbon monoxide, methane, and hydrogen may then be determined. Nitrogen is determined either by difference or by direct measurement; the final volume of gas consisting of nitrogen added as air *plus* nitrogen in the gas.

The object of the invention is to enable complete technical analyses to be performed with rapidity and sufficient accuracy without certain

disadvantages appertaining to existing forms. It is attempted to ensure this by several features.

First, the measuring burette is placed in the centre instead of at one side of the apparatus; thereby halving the possible errors due to the capillary.

Secondly, the burette is graduated in $\frac{1}{20}$ cc. out of a total volume of 120 cc., instead of in $\frac{1}{10}$ or $\frac{1}{5}$ out of a total of 100 cc. in the usual forms; the increase in volume minimizing the errors of multiplication by enabling a larger part of the gas to be taken for explosion.

Thirdly, the explosion vessel is filled with mercury, which is not usual in the Orsat type; thus obviating the errors due to exploding over water. The shape claimed for the said vessel acts to reduce the speed of the explosion.

Fourthly, the capillary is of only $\frac{1}{2}$ mm. bore instead of the usual 1 mm.; thereby again reducing the possible errors due to the capillary space.

The patentee claims:

1. In portable apparatus for complete technical analysis of coal gas and the like combustible gases, particular dimensions, graduation, and position of the burette.
2. The combined use of water and mercury as confining agents in one apparatus.
3. The dimensions of the capillary branch piece as set forth.
4. The particular shape and dimensions of the explosion vessel.
5. Portable apparatus comprising the combination and arrangements of parts as set forth and described, and illustrated in the accompanying drawings.

APPLICATIONS FOR PATENTS.

[Extracted from the "Official Journal" for Aug. 22.]

Nos. 20,503 to 21,022.

CHEMICAL ENGINEERING AND WILTON'S PATENT FURNACE CO., LTD.—"Distillation of tar." No. 20,574.

CLAPHAM, T. A.—"Valve mechanism for apparatus for purification of gases." No. 20,994.

DAVIES, W. E.—"Carbonization of fuels." No. 20,512.

JEFFERIES, R. C.—"Gas-heater." No. 20,607.

LAING, B.—"Gasification and distillation of carbonaceous materials." No. 20,953.

LODGE-COTTRELL, LTD.—"High-voltage insulator for electric gas-purifiers." No. 20,922.

LUCAS, E. E.—"Gas-fired oven furnaces." No. 20,934.

MASCHINENFABRIK AUGSBURG NÜRNBERG AKT.-GES.—"Sealing gasometers." No. 20,591.

METALLBANK UND METALLURGISCHE GES.—See Lodge-Cottrell, Ltd. No. 20,922.

MITCHELL, G. P.—"Gas-taps." No. 20,898.

NIELSEN, H.—See Laing, B.—No. 20,953.

RADIATION, LTD.—"Atmospheric gas-burners." No. 20,877.

RADIATION, LTD.—"Taps or cocks." No. 20,961.

SHADBOLT, S. M.—See Chemical Engineering and Wilton's Patent Furnace Co., Ltd. No. 20,574.

YATES, H. J.—See Radiation, Ltd. No. 20,877.

Greenock Corporation Gas Report.

The financial statement of the Greenock Corporation Gas Department for the year ended June 30 shows that the gross revenue amounted to £120,896, and the gross expenditure to £90,828. The standing charges for the year were £15,934, leaving a profit of £14,134 on the year's operations. The debit balance at the beginning of the year amounted to £7485; and consequently £6649 remained to be carried forward. The proposed new basic rates, states Mr. C. Keillor (the Engineer and Manager), are as follows: Prepayment consumers, 9d. per therm (3s. 1d. per 1000 c.ft.); ordinary consumers, 8d. per therm (2s. 9d. per 1000 c.ft.); for public street and stair lighting, 8d. per therm. In order to encourage and extend the use of gas for such purposes as central heating, new differential rates have been proposed. The quantity of coal carbonized was 34,616 tons, compared with 36,640 tons for the previous year. The gas accounted-for was 2,295,599 therms, of which 25,656 therms was water gas. The unaccounted-for gas amounted to 2·70 p.ct. The quantity of coke and breeze available for sale was 15,247 tons, as compared with 16,574 tons last year. The tar produced was 630,730 gallons, equal to 18·22 gallons per ton of coal used.

New Joint-Stock Company.—"Tropic Heaters" is the title of a Company registered, with a capital of £100, to acquire the business of a distributor of gas burners and heaters carried on by G. P. Olivier, and to undertake the business of engineers and manufacturers of gas appliances. The office is at No. 79, Lamb's Conduit Street, W.C.

Glossop Gas Company.—The balance-sheet of the Company for the half-year ended June last shows that the total receipts on the revenue account amounted to £12,794, and that the expenditure was £10,274 leaving a balance of £2520. To this amount was added £1945, making a total surplus of £4466. The Directors recommend that, after the payment of the maximum dividends on all classes of shares, the sum remaining be carried forward.

Littlehampton Public Lighting.—The Lighting Committee, at a recent meeting of the Littlehampton Urban District Council, submitted a report recommending that tenders be asked for from the Gas Company and the Electric Company for the supply of light, with full maintenance; and a Sub-Committee were appointed to arrange terms on which the respective proposals should be invited. Having regard to present conditions, it was agreed that the public lamps should not be lighted until the end of this month. The Surveyor reported that he had received an offer from a firm to give a demonstration free of charge. The Committee recommend that the offer be accepted, subject to an understanding that such acceptance is not binding on the Council in any way.

MISCELLANEOUS NEWS.

GAS REGULATION ACT APPLICATIONS.

The following further notices have appeared in the "London Gazette" with regard to applications to the Board of Trade for Orders under the Gas Regulation Act.

Birstall Urban District Council.

The maximum price now authorized in respect of the supply of gas by the undertakers is 4s. 6d. per 1000 c.ft.; and the price they have asked the Board of Trade to substitute for this is 1s. 6d. per therm.

DECLARATIONS OF CALORIFIC POWER.

Blackrod Gas Company.—450 B.Th.U. (Aug. 31.)
Blaenavon Gas and Water Company, Ltd.—425 B.Th.U. (Aug. 31.)
Brockenhurst Gas Company.—500 B.Th.U. (Aug. 31.)
Caldicot and District Gas Light and Coke Company.—500 B.Th.U. (Sept. 30.)
Cleator Moor Urban District Council.—425 B.Th.U. (Aug. 31.)
Cowes Urban District Council.—450 B.Th.U. (Oct. 1.)
Ellesmere Urban District Council.—500 B.Th.U. (Sept. 1.)
Knaresborough Urban District Council.—540 B.Th.U. (Aug. 31.)
Morecambe Corporation.—500 B.Th.U. (Aug. 17.)
North Middlesex Gas Company—500 B.Th.U. (Dec. 25.)
Skegness Urban District Council.—460 B.Th.U. (Sept. 1.)
Skipton Urban District Council.—500 B.Th.U. (Aug. 31.)
Southgate and District Gas Company.—500 B.Th.U. (Sept. 25.)
Swadlincote District Urban District Council.—450 B.Th.U. (Aug. 31.)
Tenterden and District Gas Company.—480 B.Th.U. (Aug. 31.)
Town of Dudley Gas Light Company.—450 B.Th.U. (Nov. 21.)
Wokingham Corporation.—500 B.Th.U. (Sept. 15.)

SPECIAL ORDER.

Birstall Urban District Council.

Application is to be made by the above Council to the Board of Trade under section 10 of the Act for a Special Order authorizing them to borrow money to purchase additional lands, and to make provision as to pipes between mains and meters.

GAS REGULATION ACT ORDERS.

The Director of Gas Administration has forwarded copies of the following further Orders made by the Board of Trade under section 1 of the Gas Regulation Act.

Bourne Urban District Council.

After the declared date, the maximum price in respect of gas supplied by the undertakers shall be 16·8d. per therm.

After the declared date, the price of 14·4d. per therm shall be substituted for the price of 4s. 6d. per 1000 c.ft. mentioned in subsection (2) of Article XXXIV. (application of gas revenue) of the Bourne Gas Order, 1914.

After the declared date, the price of 16·8d. per therm shall be substituted for the price of 5s. 6d. per 1000 c.ft. mentioned in Article XXXV. (charges of carrying Order into execution) of the Bourne Gas Order, 1914.

Prepayment meter clauses are included. (Aug. 15.)

Corsham Gas Company, Ltd.

After the declared date, the maximum price in respect of gas supplied by the undertakers shall be 15·4d. per therm; and this price shall be substituted for the price of 4s. 6d. per 1000 c.ft. wherever it is mentioned in section 26 (price of gas) of the Corsham Gas Order, 1906.

After the declared date, "therm" shall be substituted for "1000 c.ft." in paragraph (2) of Schedule B to the Corsham Gas Order, 1906; and "fifth of a penny" shall be substituted for "penny" wherever they occur in that paragraph. (Aug. 16.)

Ellesmere Urban District Council.

After the declared date, the maximum price in respect of gas supplied by the undertakers shall be 18d. per therm.

After the declared date, the price of 14·4d. per therm shall be substituted for the price of 4s. per 1000 c.ft. mentioned in Article XXVII. of the Ellesmere Gas Order, 1885.

After the declared date, the price of 18d. per therm shall be substituted for the price of 5s. 6d. per 1000 c.ft. mentioned in Article XXIX. of the Ellesmere Gas Order, 1885. (Aug. 17.)

Flint Gas and Water Company, Ltd.

After the declared date, the maximum price in respect of gas supplied by the undertakers shall be 16d. per therm. (Aug. 16.)

Morecambe Corporation.

After the declared date, the maximum price in respect of gas supplied by the undertakers shall be 13·6d. per therm. (Aug. 15.)

Morley Corporation.

After the declared date, the maximum price in respect of gas supplied by the undertakers shall be 14·6d. per therm.

Prepayment meter clauses are included. (Aug. 22.)

Woodhall Spa Gas and Water Company.

After the declared date, the maximum price in respect of gas supplied by the undertakers shall be 15·6d. per therm. (Aug. 25.)

A letter from the Adlington Gas Company to the District Council intimates a further reduction of 3d. per 1000 c.ft., and an allowance of 5 p.ct. on all accounts paid within a specified time, as from June 30.

PORTSEA ISLAND GAS COMPANY.

The Ordinary Half-Yearly Meeting of the Portsea Island Gas Company was held on the 23rd inst.—Mr. T. F. H. Lapthorn, J.P., the Chairman, presiding. The report on the profit and loss account showed an available balance of £58,470; and the Directors recommended that dividends be declared for the half-year ended June 30 at the following rates per annum: On the "A" and "B" shares, 13 p.ct.; 12 p.ct. on the "C" shares; 10 p.ct. on the "D" and "E" shares; and 5 p.ct. on the 5 p.ct. (maximum) stock; leaving £39,787 to be carried forward.

In moving the adoption of the report and accounts, the Chairman said the general result of the half-year's working was to show a continuance of the progress he had been able to report for the last two or three years. There was nothing in the capital account outside the normal. Turning to the revenue account, he said it was true that the receipts from the sale of gas were down by £23,048; but this was due entirely to the reduction in price. Compared with the first six months of last year, with which all the figures were a comparison, there had been a reduction in the receipts. The output of gas had increased by the substantial amount of 69,000,000 c.ft. Since June, notwithstanding the comparatively long spell of hot weather, it was surprising that there had been a drop of only 1 p.ct. The receipts from residuals showed a slight improvement; the expense of coal and oil had fallen by £12,291; the average price of coal had fallen by 5s. 10d. per ton, and that of oil to the extent of 1·69d. per gallon. The net cost was lower by £15,963, the equivalent of 1·29d. per therm. Repairs to works and plant were down by £10,630, which was entirely accounted for by the fact that last year they set aside £10,000 for special reconstruction work, the whole of which had now been carried out. Rates showed a small but welcome drop to the extent of £641. The results of the half-year's working showed a gross profit of £41,980; and after making the usual deductions for income-tax, transference to the insurance fund of £2258, and adding in the sum of £28,995, with which they started the half-year, they had an available balance of £58,470. The dividends recommended would take £18,682, which would leave them a balance of £39,788; and if they used £20,000 of that in a manner which would shortly be recommended to them—to form a pension fund—they would be left with a surplus of £19,788. Cookers on hire had increased, during the last half-year, from 37,390 to 39,425; gas-fires had increased from 3697 to 9472. New orders were coming in at the rate of nine or ten a day. In September, 1921, they were charging 1s. 2d. per therm for gas. To-day the price to the ordinary consumer was 9d.; and they were in a position now to make a still further reduction of 4-10ths of a penny per therm to ordinary consumers and 6-10ths of a penny to prepayment consumers, as from the beginning of next quarter. The reduction would save their consumers about £18,000 a year.

The Chairman next proposed to lay before the meeting a proposal of the Directors to establish a scheme of pensions for the benefit of their non-salaried employees. The Directors, he said, had long been anxious to make some provision for the employees of the Company in their old age, similar to that which existed in the case of the salaried employees. It was suggested that the Company and the employees should contribute equal amounts, and that the Company, in addition, should supplement these contributions to the extent necessary to meet the claims of the present employees in respect of their past service. It was recommended that a sum of £20,000 should be applied to the scheme out of the profit and loss account. The annual contribution required from the Company at present would be about £2700 a year. The £20,000 would provide £1000 as interest, so that the amount required would be about £1700. He moved that the Directors be authorized to establish a workmen's pension scheme such as he had outlined, and that £20,000 should be allocated to the purpose out of the profit and loss account.

The scheme was adopted.

FACTS ABOUT GAS.

Mr. D. H. Helps and the "Reading Observer."

A few days ago, Mr. D. H. Helps (General Manager of the Reading Gas Company) was interviewed by a representative of the "Reading Observer;" and as a result many interesting facts were published about gas—information which, according to the newspaper mentioned, "appears to destroy completely the arguments put forward against the use of gas."

Mr. Helps explained that he had taken great pains to study the effects of gas on birds and animals. He gave an instance where, in the top of a street gas-lamp, between the cover and the mantle, were discovered two birds' nests. One of the nests contained young birds, and the other had eggs in it. As their entrance to this part of the lamp was the only exit for fumes, it can be seen that the birds, far from being harmed by the gas, thrived on it. Some years ago he visited the Regent's Park Zoological Gardens, and found that incandescent gas-burners were installed in the rare and delicate birds' house. He was told by the keeper that since the introduction of these burners there had been a great improvement in the health of the birds, and less mortality among them. The largest birds confined in this house were birds of paradise; while others were of the smallest and most delicate species of foreign birds which it was possible to keep in captivity.

Mr. Helps gave another instance where a gas-stove was kept burning continuously in a vivarium; the animals confined in the place being completely healthy. He said that hundreds of gas-stoves were used in aviaries and bird rooms; and breeders were enthusiastic in their praises of the use of gas as a means of keeping the birds in perfect condition. One well-known fancier had written stating that he had installed a gas stove in a room in which he was at one time keeping some 200 foreign birds. This testimony, he thought, showed the non-injurious effect upon bird life of gas used as a heating agent.

BARNET DISTRICT GAS AND WATER COMPANY.

The Ordinary Half-Yearly Meeting of the Company was held last Monday at the London Offices, No. 139, Cannon Street—Mr. Arthur F. Phillips in the chair.

The Secretary (Mr. E. D. Davey, A.C.A.) read the notice convening the meeting; and the Directors' report and the accounts were taken as read.

The Chairman, in moving their adoption, said he trusted the position would be considered satisfactory. The price of gas for the last three months was one penny per therm less than during the corresponding previous half-year; and a further reduction of one penny was made from midsummer, reducing the price to 11d. per therm. The sale of gas remained practically the same as last year. There was no expenditure on capital on the gas account, but a slight reduction of £208 for depreciation. The gas rental for the half-year was £32,670, against £32,994 for the previous year. Coal cost £15,823—against £17,017; the total charges for manufacture being £24,232 against £28,518 the previous corresponding half-year—an economy of £4286. The distribution charges were £966 more. Residual products produced £10,739, as against £8706. The result of the half-year's working was a credit to profit and loss of £13,722, against £8991 the previous period. In the water undertaking, there was a capital expenditure of £1237 for extension of mains; while the half-year's water revenue was £33,802, against £27,822 the previous corresponding period. Pumping charges were £6295, against £6784. The total working expenses for the half-year were £19,308 (against £19,464); and the balance of revenue carried to profit and loss was £14,598, compared with £8461 the previous year. The balance standing to the credit of profit and loss was £37,161; and after paying for the half-year the statutory dividends of 10 p.ct. on the "A," "B," and "C" stocks, and 7 p.ct. on the "D" capital stocks, there would remain £24,542 to carry forward. The gas and the water works had both been maintained in a thoroughly efficient state. The gas-works were equal to meeting all demands likely to be made upon them; while to the water undertaking additions were continually being made. The extent of the district and the population supplied with water greatly exceeded the gas area; and at the last meeting the proprietors were informed that a new pumping station at Roestock was in course of construction. This was practically completed, and had turned out most satisfactory; and it was now proposed to take in hand a considerable extension of the Tyttenhanger pumping station. It was necessary to realize that the district supplied by the Company was a difficult one—employing many pumping stations—making working costs high.

The Deputy-Chairman (Dr. J. W. L. Glaisher, F.R.S.) seconded the motion for the adoption of the report and accounts, which was carried *nem. con.*

The Chairman next proposed, and Mr. Colin Docwra seconded, that dividends for the half-year to June 30 be declared at the rate of £10 p.ct. per annum on the "A," "B," and "C" stocks, and at £7 p.ct. per annum on the "D" capital gas and water stocks—all less income-tax. This was carried unanimously.

The Chairman, remarking that it was satisfactory to be able to declare the maximum dividends allowed by law, paid a tribute to the work of the Engineer (Mr. F. J. Bancroft, B.Sc., M.Inst.C.E., M.I.Mech.E.) and to the Secretary (Mr. E. D. Davey, A.C.A)., who, he said, kept the Board in order on all financial questions. He proposed a vote of thanks to them and their staffs, which was seconded by Mr. Alfred Wood, and carried.

Mr. F. J. Bancroft replied for himself and Mr. Davey, pointing out that their efforts were supported by a loyal and good-working staff.

The meeting closed with a vote of thanks to the Chairman for his conduct of the proceedings and to the Board for the direction of affairs. This was proposed by Mr. J. S. Ineson, seconded by Mr. J. Mackworth Wood, and carried *nem. con.*; the Chairman making suitable acknowledgment.

CAUSE OF GAS POISONING CASES.

Commenting upon gas poisoning cases and their causes, "Chemical and Metallurgical Engineering" remarks that for some reason even technical men seem sometimes to lose sight of the fact that it is not the carbon monoxide in the gas, but the carbon monoxide formed from its improper combustion, from which danger mostly arises.

When water gas was first made, the writer goes on, there was a great deal of anxiety lest the higher carbon monoxide content of the gas should give rise to a greater increased number of poisoning cases. Experience, however, soon showed that there was little, if any, greater danger with 30 p.ct. of carbon monoxide in carburetted water gas than with 8 or 10 p.ct. carbon monoxide mixtures in coal gas. Cases in which there was accidental exposure to sufficient concentrations for serious results with the one gas would almost always entail equally serious consequences with the other. Repeatedly during the past twenty-five years efforts have been made to control by legislative enactment, or other means, the percentage of carbon monoxide in town gas supplies; but "fortunately practically every such effort has been met with a frank, clear explanation of facts, so that there has been no handicap placed upon the industry in its development of whichever gas was most economical to make."

Just now, however, our American contemporary goes on to point out, there appears to be a tendency to renew legislative efforts of this sort; and technical men who are called upon for assistance in settling such problems should be very sure of their facts before allowing their general impression as to the danger of carbon monoxide to lead them to false conclusions. Any hydrocarbon gas mixture when burned in a bunsen-type burner makes carbon monoxide in large quantity as the primary product of combustion; but with properly designed and adjusted appliances, all this carbon monoxide is completely oxidized to carbon dioxide before the products of combustion leave the zone of

the outer flame. Thus there is no carbon monoxide discharged from the appliance, except in the case of some high-efficiency, high-capacity water-heaters, which, even on proper adjustment, occasionally produce small quantities of carbon monoxide in the flue products; but all such appliances which make carbon monoxide are connected to a flue, so that there is no more danger from the carbon monoxide in the products from these appliances than there is from furnace gas from the ordinary house-heating equipment for burning solid fuel. However, an improperly designed or dirty and poorly adjusted cooking-stove burner may fire-back, and allow the gas to burn inside the mixing chamber of the burner. Then this burner is likely to become a splendid carbon monoxide generator, delivering its dangerous products of combustion directly into the kitchen. Similarly other appliances can be equally culpable, if cheap and poorly designed; but it is the appliance, and not the gas, that is at fault.

TRADE NOTES.

Gas Exhibit at Chester.

The whole of the lighting of the stand of the Chester United Gas Company at the local trades exhibition was carried out with the well-known "Efficient" indoor lamps, burners, and fittings manufactured by Burners (1921), Ltd., of Bromsgrove. The display was exceptionally attractive, for all the burners and fittings were of the new nickel-alloy finish, thus giving the appearance of an all-silver exhibit.

The Underfeed Stoker Company, Ltd.

Unfortunately we have not sufficient space to publish the long list of recent sales forwarded by the Underfeed Stoker Company, Ltd. It is ample proof of the activity and enterprise of this well-known firm, and of the appreciation of the users of their installations. The list contains the more important sales of travelling-grate and underfeed stokers, air heaters, ash conveyors, arches, coal conveyors, &c.

"Kildark" British Made Burners.

Messrs. Lighting Trades, Ltd., of Nos. 51-55, Garratt Lane, Wandsworth, S.W. 18, are now offering, under the trade name of "Kildark," a comprehensive range of British-made gas-burners. Included in the range are several superheater burners, having cast aluminium gallery and deflectors, a type specially recommended, as the parts in contact with the products of combustion are aluminium, which does not corrode. A recent test with one of these burners fitted with two "Ironclad" bijou mantles gave a mean-hemispherical light of 117 c.p. on a gas consumption of 3·5 c.ft. per hour. Glassware and silk shades for gas lighting are also now offered by the Company.

Welsbach-Kern Radiators.

The season 1923 24 Welsbach-Kern radiator catalogue, besides all the well-known designs manufactured for many years past by the Welsbach Light Company, Ltd., of Gray's Inn Road, W.C., includes a number of new and handsome patterns put upon the market for the first time. In many cases, both new and old designs are now fitted with a great convenience in the form of an independent gas boiling-ring. There are heaters here suitable for all positions. The mixture of air and gas, in proportions ensuring complete combustion, burns in perforated tubes made of special composition. The "Handi-heater" radiator, working on the Kern principle, is a cheap portable form which met with much favour on its introduction towards the end of last season; and further slight improvements have been made in it for the coming season.

The "Premier" Gas-Engine.

A new publication describing the double-acting vertical type of gas-engine manufactured by the Premier Gas-Engine Company, Ltd., of Sandiacre, has been received. This engine combines the best features of the double-acting tandem horizontal, and of the single-acting vertical tandem types; and the makers claim that a big field of development awaits this engine where waste gases are available for conversion into power—such as is the case at blast furnaces and coke-ovens. The engine is described in detail in the pamphlet, which is full of useful information, and well repays careful reading. Of the moderate-speed type, it has proved highly successful in working under iron and steel works conditions, and can be developed up to very large units. Offers are, in fact, at present being made for units as large as 4000 KW. From the drawings attached to the pamphlet it is seen that four double-acting cylinders work through a triangular connecting rod on to a single crank.

New Contracts of Messrs. Samuel Cutler & Sons, Ltd.

We learn that Messrs. Samuel Cutler & Sons, Ltd., have recently secured a number of important gasholder contracts, including a large three-lift holder with the "Cutler" triangulated guide frame for the Hampton Court Gas Company, a three-lift guide-framed holder for the Newport (Mon.) Gas Company, a two-lift spiral holder and steel tank, with Cutler "Steel-All" guide carriages, for the Rugeley Gas Company, and a five-lift guide-framed holder for the Margate works of the Isle of Thanet Gas Light and Coke Company. Another contract for the Gas Light and Coke Company is for the removal of a 100-ft. diameter two-lift holder and steel tank (originally constructed by the firm) from Ilford to Bromley. Their Italian business is being renewed by the erection of a holder at Bari. They also have under construction a number of large purifier covers, a considerable extension of the coke telpher plant at Brighton (where they are also erecting a new gasholder), and a large assortment of general gas-works engineering, including two sets of carburetted water-gas plant, with steel-framed buildings, for the Hemel Hempstead Gas Company. It is gratifying to find that this old-established firm is, by excellent organization, able to maintain successfully the position so long occupied in gas-works engineering.

A fire which threatened serious danger to the bye-product plant of the Shelton Iron, Steel, and Coal Company's works at Hanley occurred last week. It was caused by the ignition of a quantity of naphthalene. After three hours of strenuous effort, the outbreak was subdued.

THE NORTH-EAST COAST COAL TRADE.

From our Own Correspondent.

This week has seen what it is hoped on 'Change will be the turning-point in the market. A far more cheerful tone has prevailed than for some weeks past. Several factors seem to have influenced the position. The resumption of work generally by the London dockers is already having its effect on increased shipments, and the demand from that quarter is likely to become still brisker as accumulations of stocks are cleared. The threatened trouble in the American mines, too, seems to have caused consumers on the Continent to take the market more seriously, and to realize that the recent prices quoted here are perhaps, after all, rock bottom, and that they are likely to rise rather than slump still further. Considering how near they have been to production costs, collieries would have to lay the pits idle and curtail production rather than sell at much less.

There has been considerable inquiry during the week for all periods, but especially October-December. As collieries are nominally well sold for this period, and, with a continuance of the better tone, contractors will most likely be more eager to take out their full quantities, there appears every prospect of prices hardening; and the forward market is distinctly firm. Business for best qualities of gas has been done up to the end of the year at 23s. f.o.b.; but the price at the end of the week was more like 23s. 6d. to 24s. For September, there is still cheaper coal to be had, both through second-hand holders and direct. But prices depend upon individual colliery positions; some of the second-class gas qualities being still in a weak condition.

As regards business for next year, very little has been done as yet. Sellers are not keen on reducing quotations below a basis of about 23s. 6d. or 24s., and they may be said to be pretty firm at these figures for bests, while buyers generally want to be on at less. But many are sounding the market.

COAL TRADE IN THE MIDLANDS.

From our Local Correspondent.

The falling off in the demand for all classes of fuel is very marked. Some of the gas undertakings are calling for a readjustment of supplies, though most of the larger concerns, with ample storage accommodation, are taking the regular quota. Works that are not already stocked up to their full storage capacity have a bigger reserve in hand than they customarily carry. The reduction in industrial consumption is largely responsible for the over-gorged state of the market. It is confidently expected that the position will soon be relieved, as manufacturing activity usually grows brisker in September. There will, moreover, be a considerable increase in the consumption of gas when "summer time" comes to a close. The effect of the shrinkage in current business on prices is therefore not very appreciable. Collieries are curtailing output; many pits in this district being restricted to three or four days a week. Where stocks have accumulated to such an extent that there is pressure to sell, prices are shaded, but hardly enough to unsettle the general position. The change in the weather is causing more attention to be given to the renewal of household supplies. Fluctuations in the coke position have not brought any great increase of offers on the home market.

At the moment blast-furnace owners are more concerned about the stabilization of the selling prices of pig-iron than they are about the price of coke. The arrangement under which Midland furnaces were to receive supplies on the basis of 26s. at ovens till the end of August, has been renewed. No definite period has been agreed upon.

YORKSHIRE AND LANCASHIRE COAL TRADE.

From a Local Correspondent.

The demand generally for gas coal in Yorkshire and Lancashire is less than the production, and the export inquiry is less active. Collieries for the most part are working from week to week. The demand for industrial coals shows no improvement, and the small quantity of household fuel sold has been at fairly low prices. Export generally is quieter, and there are indications that the Continental demand is subsiding, lower prices having been quoted for the smaller quantities exported. Typical prices include Yorkshire, Derbyshire, and Notts large screened steam 20s. 3d. to 21s. f.o.b.; cargo for export (f.o.b. usual shipping ports), best Yorkshire hards, 25s.: Derbyshire best hards, 24s. 3d. to 24s. 6d.; West Yorkshire Hartleys, 21s. to 23s.; South Yorkshire washed doubles, 25s. 3d. to 25s. 6d.; South Yorkshire washed singles, 25s. 6d. to 25s. 9d.; dry doubles, 22s.; South Yorkshire washed smalls, 18s. 6d. to 18s. 9d.; Derby slack (1 inch), 14s. 6d. to 15s.; South Yorkshire rough slack, 15s. 6d to 16s.; gas coke, 35s. to 36s.; foundry furnace coke, 44s. 6d. to 45s.; washed smithy pens, 26s. to 29s. 6d.; washed steam thirds, 23s. 3d.; South Yorkshire washed trebles, 26s. per ton.

The home demand is not active apart from the supplies taken by the railway companies. All classes of small steam coal are in good supply; but coking slacks, owing to the continued working of the bye-product plants when the pits were closed during the holidays, are difficult to obtain.

Aberystwyth Gas Company.—The report of the Directors for the half-year ended June 30 shows a balance of profit of £1311, out of which it has been proposed to pay dividends as follows: On the original shares at the rate of £13 10s. p.ct. per annum, £9 9s. p.ct. on the new shares, 5 p.ct. on the preference shares, and £4 10s. p.ct. on the debentures, all less income-tax. These payments will absorb £1266, leaving £45 to be carried forward. The thermal value of the gas has been increased to 450 B.Th.U. per c.ft.; and it has been resolved to reduce the price from Christmas next to 10d. per therm (3s. 9d. per 1000 c.ft.)—a figure only 22 p.ct. in excess of the lowest pre-war charge.

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

London, *Aug.* 27.

As usual during the holiday season there is little business doing in tar products; and although prices remain steady, there is nothing new to report.

Tar Products in the Provinces.

Aug. 27.

The average values for gas-works products during last week were: Gas-works coal tar, 80s. to 85s. Pitch, East Coast, 135s. to 140s. f.o.b. West Coast—Manchester, 132s. 6d. to 137s. 6d.; Liverpool, 133s. 6d. to 138s. 6d.; Clyde, 133s. 6d. to 138s. 6d. Benzole 90 p.ct., North, 1s. 2½d. to 1s. 3½d.; crude 65 p.ct. at 120° C., 10d. to 10½d. naked at makers' works; 50-90 p.ct., naked, North, 1s. 7d. to 1s. 7½d. Toluole, naked, North, 1s. 7d. to 1s. 8d. nominal. Coal tar crude naphtha in bulk, North, 8d. to 8¼d. Solvent naphtha, naked, North, 1s. 2½d. to 1s. 4d. Heavy naphtha, North, 1s. 5½d. to 1s. 7½d. Creosote, in bulk, North, liquid, 8d. to 8¼d.; salty, 7½d. to 8d.; Scotland, 6⅝d. to 7¼d. Heavy oils, in bulk, North, 8¼d. to 9d. Carbolic acid, 60 p.ct., 3s. 4d. to 3s. 5d. prompt. Naphthalene, £15 to £16; salts, £6 to £8, bags included. Anthracene, "A" quality, 4d. per minimum 40 p.ct., purely nominal; "B" unsaleable.

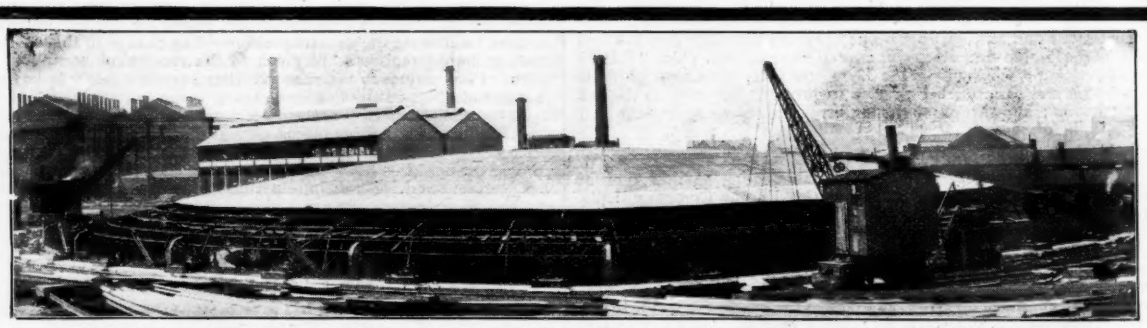
Public Lighting at Midhurst.—At a parish meeting held in the Midhurst Town Hall last Wednesday, it was resolved to accept the Gas Company's tender to light 35 lamps for the ensuing year at a cost of £150. The Gas Company also intimated their willingness to substitute inverted burners for upright ones at special corners. This price compares with £168 paid in the previous lighting season, thus showing a saving of £18. The number of lamps to be lighted represents only one-half of the total number in the town; but it was felt that, if all were lighted, the increased comfort would not be commensurate with the higher lighting rate.

Winchester Water and Gas Company.—The ordinary general meeting of the Company was held yesterday, when the Directors presented their report and the accounts for the half-year ended June 30. The balance of net revenue account available for dividend was £5462; and the payment was recommended of a dividend on the preference stock at the rate of 4 p.ct. per annum, less income-tax, and on the consolidated ordinary stock at the rate of £5 15s. for the half-year, less income-tax, making up the dividend for the year to 5 p.ct., which is the one authorized. The Directors intend to make a further reduction of 1d. per therm (4½d. per 1000 c.ft.) in the price of gas, to take effect as from Michaelmas next.

Extensions at Nantwich.

The Nantwich Urban Council had before them last week the report of Mr. J. H. Brearley on the proposed extension of the carbonizing plant at the gas-works. In this report, Mr. Brearley pointed out that for the year ended March 31, 1913, the loans received, *less* loans repaid, amounted to £70,942, or about £1440 per million c.ft. of gas sold. For the following year the net figure was £66,492—equivalent to £1292 per million. The sale for that year was 51,452,000 c.ft. For the year ended March 31, 1922, the loans received, *less* loans repaid, amounted to £61,338, and the gas sold to 60,503,000 c.ft., a ratio of £1014 per million. Thus the outstanding loans in nine years, from 1913 to 1922, had diminished by an aggregate of £8634. In the same period the total income increased. In view of the substantially improved financial stability, there was no occasion for any reluctance in considering schemes for works improvement. Inspection of the works showed that something must be done to the carbonizing plant. The maximum quantity of gas sent out in one day had exceeded 300,000 c.ft.; and a substantial scheme was called for to provide for this. He had examined the cost set down by Mr. Vernon, and saw no reason why on the present basis of labour and material costs, the estimated sum should be exceeded; and he thought the saving of £600 in the cost of manufacture would be on the conservative side. At its completion they would have a plant which would provide a margin for future growth. He advised that, in making application for the loan, a period of 25 years be asked for. Mr. A. Peake, the Chairman of the Gas Committee, moved that the scheme be proceeded with, and mentioned that the proposed expenditure was justifiable and prudent. In opposing the scheme, Mr. Wright stated that, from a financial point of view, the position of the gas-works was a deplorable one. Before they could get a penny profit, they would have to provide the sum of £3500 for interest alone; and the gas consumer would in consequence always have to pay a high price for gas. After further discussion, the proposal to proceed with the scheme was carried.

Morpeth Gas Light Company, Ltd.—The annual meeting of the Company was held yesterday, when the Directors presented their report and the accounts for the year ended June 30. The gross profit amounted to £3163, which, with £682 brought forward from the previous year, gave an available sum of £3845. It was proposed that this should be dealt with in the following manner: In writing off for depreciation on meters and cookers, £200; in placing to reserve for special renewals of plant, &c., £500; in placing to the general reserve account, £250; income-tax and corporation profits tax, £529; in paying 5 p.ct. for the year on preference shares, £700; and in paying 6 p.ct. (free of tax) for the year on ordinary shares, £924. The balance carried forward was £785. The satisfactory state of affairs has enabled the Directors to announce a further reduction of 6d. per 1000 c.ft. in the price of gas, making the present price 5s., less 5 p.ct. discount.



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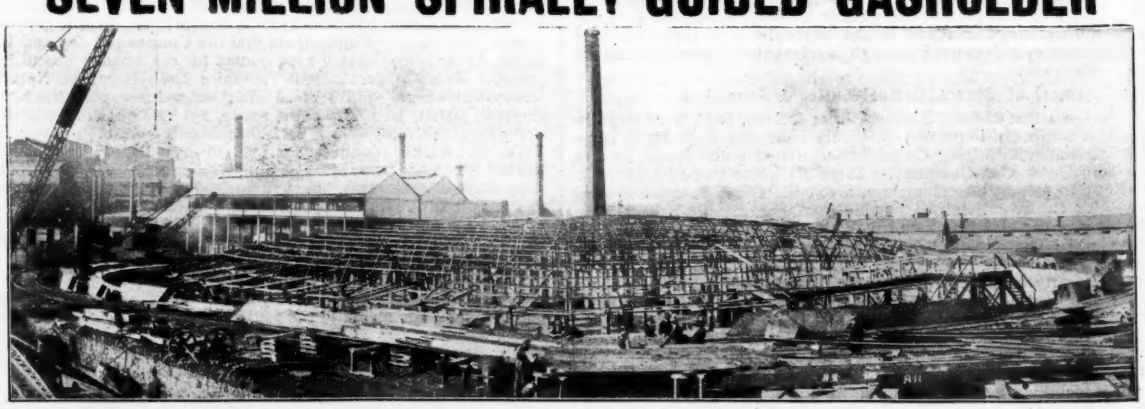

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Coatbridge Gas Company.

The annual report of the Company was submitted at the shareholders' meeting on Aug. 21. It showed that the sale of gas for the year amounted to 1,145,211 therms—an increase of 52,198 therms compared with the previous year. From the results of the six months' working till December last, the Directors felt justified in reducing the gas rate as from Jan. 1 by a further 1·4d. per therm. Payment of dividends in accordance with the sliding-scale were recommended at the rate of £14 5s. per annum on the original stock, and £9 19s. 6d. on the four issues of £10 shares, all less income-tax. In moving the adoption of the report, Mr. A. S. Legat (the Chairman) remarked that two years ago they started with a debit balance of over £3000, and now they had a credit balance of £6000, and this notwithstanding the fact that they had during that period reduced the price of gas by 3·8d. per therm. The sales of gas showed only a slight increase over those of 1913, so that they were making some progress; and of course it was entirely on their make and sale of gas that their prosperity depended. The present price was 7d. per therm. Comparing the year 1913 with the past year, when they made practically the same quantity of gas, the Chairman said that in 1913 they had used 28,098 tons of coal costing £16,246, while this year only 18,799 tons were used, costing £19 524. Their costs for wages in 1913 were £4487, while this year, though wages were nearly 100 p.ct. higher, the total sum was £4210. In 1923, residual products yielded £21,110, from the much smaller quantity of coal, as compared with £15,281 in 1913. All this went to show that the Company had been well advised in erecting the new vertical-retort plant.

Gas Fraud at Kidderminster.—At the Kidderminster Police Court last week, Walter M'Latchley, of Kidderminster, was charged by the Gas Company with altering pipes connected to the gas-meter, and obtaining gas without payment. A fitter in the employ of the Company said he found the meter had been disconnected. The service pipe was connected to the house supply by means of a rubber tube which was fitted to the two lead unions. The gas used did not pass through the meter. Defendant was fined £5, with the option of a month's imprisonment.

Prolonged Gas Strike Ended.—Through the intervention of the Waterford Corporation, the prolonged strike at the gas works has ended; the men accepting the Company's proposals. The strike originated regarding the trimming of coals; the Irish Transport and General Workers' Union members disputing with the Dockers' Union as to their right in the matter. Terms now arranged provide that only 40 of the 70 men formerly employed shall be taken back; but the Company agreed to pay the unemployed 10s. per week each for three months, and to reinstate them as work became available. In consequence of this long dispute, Waterford has been without gas since February.

Irish Gas Dividends.—The Directors of the Alliance and Dublin Consumers' Gas Company have declared a dividend of 5½ p.ct. per annum, placing £5815 to reserve, and carrying forward £11,802. Last year the dividend was 5 p.ct. The Dundalk Gas Company have declared a dividend of 20s. per share on the "A" shares, and 15s. per share on the "B" shares, compared with 15s. and 10s. 6d. respectively a year ago, and 20s. and 15s. six months ago.

Abergele Gas Question.—As a result of the deputation to the Board of Trade, the Abergele Urban Council have succeeded in limiting the maximum price of gas to be charged by the Abergele Gas Company to 1s. 7⅛d. per therm, instead of 1s. 9d. per therm, which the Gas Company proposed should be the maximum. This reduction is equivalent to 4d. per 1000 c.ft. at a calorific standard of 460 B.Th.U. The Company have recently increased the calorific standard to 480 B.Th.U. per c.ft.

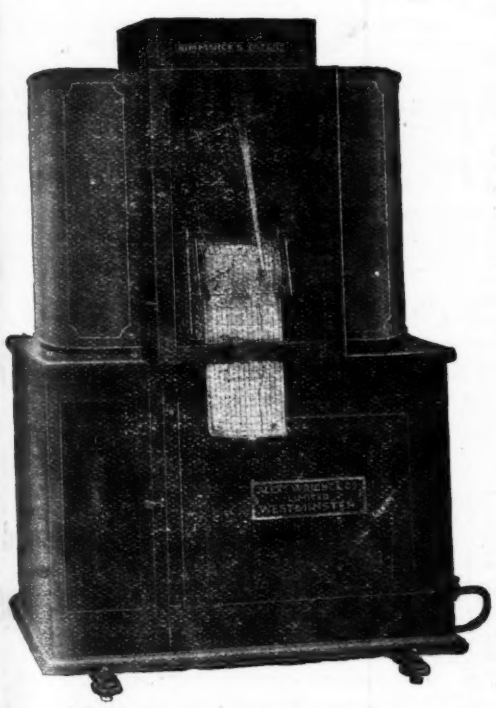
Northampton Gas Prices Reduced.—Notice has been given by the Northampton Gas Light Company that from June 30 last the price of gas to ordinary consumers is reduced to 10d. per therm (3s. 11d. per 1000 c.ft.) with a corresponding reduction to prepayment consumers. This rate is also subject to special rebates announced earlier in the year. The price of gas for engines is reduced to 6⅜d. per therm (2s. 7·7d. per 1000 c.ft.). The usual discount of 10 p.ct. for prompt payment will be continued.

Fleetwood Gas Company.—The half-yearly meeting of the Company was held on Aug. 22, Mr. William Rogerson, Managing Director, presiding. The report showed gross profits of £1915, reduced by loan interest to £1538. Dividends were declared as follows: 7½ p.ct. per annum on the preference stock, and 5 p ct. per annum on the ordinary stock. This absorbed £1166; the balance of £371 being carried forward. The Directors decided to reduce the price of gas by 5½d. per 1000 c.ft., commencing on Oct. 1 next.

Cleveland Gas Company.—The ordinary general half-yearly meeting of the Company will be held this afternoon, when the Directors will present their report and the accounts for the half-year ended June 30. A profit of £264 is shown; and it is intended to carry this forward to the next accounts. The consumption of gas has fallen considerably, which is largely responsible for the unsatisfactory results. The report states that the improvement in the Cleveland mining industry has disappeared, and that the prospects for the future seem to be decidedly gloomy.

Worthing Gas Light and Coke Company.—The half-yearly general meeting of the Company was held last Saturday, when a satisfactory statement of the working for the half-year was made. The profit and loss account showed a balance of £21,678. Out of this sum the Directors recommended the declaration of a dividend at the rate of £5 10s. p.ct. per annum (less income-tax) on the consolidated ordinary stock for the half-year ended June 30. Mention is made in the report of the appointment of Mr. E. T. Hewett to the position of Distribution Superintendent, and also of the acquiring of new showrooms.

THE CALORGRAPH



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STOCK MARKET REPORT.

Business on the Stock Exchange last week opened in better heart, the strike termination imparting a ray of cheerfulness. Home Governments, after a little hesitation, took a good turn. Home Rails were better, and the Foreign Market was strong. Later on there was much uncertainty. On Wednesday there was a blowing of trumpets; but on Thursday this was dashed by dissatisfaction with the French Note. Another change took place on Friday. Home Governments were very active and strong. The old favourites, Oil and Rubber, had a good week.

Business in the Gas Market was, if anything, rather quieter than in the week before. The array of issues dealt in was very small, and the big companies almost monopolized the lion's share. Changes in quotation were nearly all *ex div.* adjustments; and the two or three exceptions do not call for special notice.

The following transactions in gas during the week were recorded: On Monday, Brentford "A" 102¼, 103¼, 103½, British 12¼, Commercial 4 p.ct. 94¾, 95, Croydon sliding-scale 102⅜, European 7⅛, Gas Light ordinary 96¼, 96⅜, 96¾, 96⅞, ditto 3½ p.ct. maximum 65½, 66⅛, ditto 4 p.ct. preference 80¾, 81, Imperial Continental 160½, 161, 162, Primitiva 6s. 9d., ditto 5 p.ct. preference 30s., South African 7⅜, South Metropolitan 98, Tottenham "B" 101. On Tuesday, Alliance and Dublin 72¼, Brentford "B" 102, Croydon s.s. 103½, Gas Light ordinary 96¼, 96½, ditto 3½ p.ct. maximum 66, Imperial Continental 161½, Primitiva 5 p.ct. preference 31s., South African 7⅜, South Metropolitan 97, 98¼, Tottenham "B" 102. On Wednesday, British 12⅛, Continental Union preference 76, Gas Light ordinary 96⅛, 96¼, 96½, ditto 4 p.ct. preference 80¾, ditto 3 p.ct. debenture 61⅜, Imperial Continental 160½, 161, Newcastle 84½, Primitiva 6s. 9d., South Metropolitan, 97⅜, 98, 98½, ditto 3 p.ct. debenture 62⅜, Tottenham "B" 102, 103, Wandsworth and Wimbledon 112¼, 112½, Montevideo 5 p.ct. 1st mortgage 74½. On Thursday, Alliance and Dublin 73¼, 73⅜, Brentford "A" 103½, Cape Town 4½ p.ct. preference 6¼, Gas Light ordinary 96¼, 96½ 97, ditto 4 p.ct preference 80⅜, 82, Imperial Continental 160, 161½, ditto 3½ p.ct. debenture 75. 77, Primitiva 5 p.ct. preference 30s., South Metropolitan 98½, Tottenham "B" 102½. On Friday, British 12, 12⅛, European 7⅛, 7⅛, Gas Light ordinary 96⅜, 96½, 97, ditto 4 p.ct. preference 81, 82, Primitiva 5 p.ct. preference 31s., South Metropolitan 97⅜, ditto 6½ p.ct. debenture 108⅛, 108½, Brighton and Hove 5 p.ct. debenture 97½, 98, 99, 100, Leatherhead 5 p.ct. 11¼, 11 9/16.

In the Money Market, there was a series of those changes from ease to firmness and back again which almost seem to have become the normal condition of the market. At all events, it ruled again last week. Rates opened firm in recognition of a good demand, and hardened to some extent as the pressure continued. But supplies came in aid of the position; and the closing situation was comfortable. Discount terms also were easier. Silver fell steadily till near the close, when it rallied to a moderate extent. The Bank of England rate is 4 p.ct., as fixed on July 5.

ANTE-WAR PRICES AND DIVIDENDS, LATEST DIVIDENDS, AND LAST WEEK'S TRANSACTIONS.

Issue.	Share.	When ex-Dividend.	Ante-War Dividend & Bonus.	Last Dividend.	NAME.	Closing Prices, July 30, 1914.	Present Prices.	Lowest and Highest Prices of Transactions.
£			p.c.					
131,978	Stk.	Aug. 9	—	5%	Aldershot 5 p.c. max. C.	..	72—77	...
190,492	,,	,,	4	4%	Do. 4 p.c. Pref.	..	70—75	...
1,551,868	,,	Apl. 5	2½	5%	Alliance & Dublin Ord.	59—64	72—77	72¼—73⅜
374,000	,,	May 17	4	4%	Do. 4 p.c. Deb.	76—79	62—67	...
280,000	5	May 17	7½	4/-	Bombay, Ltd.	5⅛—6⅛	5½—5¾	...
100,000	5	Aug. 9	16	8/6	Bournemouth Gas and Water — 5 p.c.	..	11⅜—12⅜	...
383,110	10	,,	7	7/-	Bournemouth Gas and Water — B 7 p.c.	13—13½	11⅜—12⅜	...
115,000	10	,,	6	6/-	Bournemouth Gas and Water — Pref. 6 p.c.	13⅛—14	10⅜—11⅜	...
162,065	—	June 28	—	4%	Bournemouth Gas and Water — 4 p.c. Deb.	..	77—82	...
992,045	Stk.	July 12	14	6⅛	Brentford A Consolid.	261—266	100—105	102½—103½
734,920	,,	,,	11	6⅛	Do. B New	204—209	100—105	102½
55,000	,,	,,	5	5%	Do. 5 p.c. Pref.	109—111	83—88	...
221,400	,,	June 14	4	4%	Do. 4 p.c. Deb.	91—93	77—82	...
214,775	,,	Aug. 23	11	11⅛%	Brighton & Hove Orig.	208—213	171—176*	...
244,200	,,	,,	8	8⅛%	Do. A Ord. Stk.	154—159	127—132*	...
1,272,500	Stk.	July 26	5	5%	Bristol 5 p.c. max.	..	97—98	...
570,000	20	Mar. 22	12½	10/-	British A Ord.	44—45	12—13	12—12½
10,000	10	June 28	—	7/-	Do. 7 p.c. Pref.	..	11½—12½	...
120,000	Stk.	,,	4	4%	Do. 4 p.c. Deb. Stk.	88—90	74—79	...
220,335	,,	,,	4	4%	Buenos Aires 4 p.c. Deb.	85—87	56—59	...
100,000	10	May 17	—	—	Cape Town & Dis., Ltd.	1⅛—2⅛	6⅛—7⅛	...
100,000	10	May 3	—	4/6	Do. 4½ p.c. Pref.	4—6	6—7	6½
100,000	Stk.	June 28	4½	4½%	Do. 4½ p.c. Deb. Stk.	70—75	70—75	...
237,860	,,	,,	—	7⅛%	Cardiff 7½ p.c. Deb.	..	106—111	...
157,150	,,	Feb. 26	5	5%	Chester 5 p.c. Ord.	108—110	..	...
1,513,280	,,	July 25	5/9/4	60/-	Commercial 4 p.c. Stk.	106—108	94—97	94⅛—95
360,000	,,	,,	5⅛	60/-	Do. 3½ p.c. do.	103—105	94—97	...
475,000	,,	June 14	3	3%	Do. 3 p.c. Deb. Stk.	69⅛—71⅛	58—62	...
800,000	,,	Dec. 15	4	—	Continental Union, Ltd.	76—79	35—40	...
200,000	,,	Dec. 14	7	4%	Do. 7 p.c. Pref.	115—118	72—77	76
660,000		Aug. 9	—	6⅛%	Croydon sliding scale.	..	101—104	102½—103⅛
284,975		,,	—	5%	Do. max. div.	..	81—85	...
492,270	Stk.	—	6	4⅛%	Derby Con. Stk.	123—125	..	...
55,000	,,	—	4	4%	Do. Deb. Stk.	102—104	..	...
209,000	,,	Apl. 5	—	5%	East Hull 5 p.c. max.	..	..	...
1,002,180	10	July 12	10	5/0	European, Ltd.	17⅛—18	7⅛—8⅛	7⅛—7 13/16
16,546,120	Stk.	July 26	4/17/4	52/-	Gas Light — 4 p.c. Ord	98—102	96—98	96⅜—97
2,600,000	,,	,,	3½	33/-	Gas Light — 3½ p.c. max.	76—79	65—68	65½—66½
4,062,235	,,	,,	4	4%	Gas Light — 4 p.c. Con. Pref.	96—99	80—82	80½—82
4,761,930	,,	June 14	3	3%	Gas Light — 3 p.c. Con. Deb.	72½—74½	60—63	61½
130,000	,,	Dec. 11	10	10%	Gas Light — 10 p.c. Bonds	..	..	...
	—	—	—	—	Gas Light — 7½ p.c. Ilford Deb.	..	..	...
82,500	,,	Mar. 8	5	63/7½	Hastings & St. L. 5 p.c.	..	92—97	...
258,740	,,	,,	3½	50/7½	Do. 3½ p.c.	87—89	75—78	...
70,000	10	May 17	11	10%	Hongkong & China, Ltd.	16½—16¾	15—16	...
86,600	Stk.	Aug. 23	9	9⅛%	Hornsey 7 p.c.	..	144—149*	...
1,976,000	,,	May 31	9	£17	Imperial Continental	150—160	158—163	160—162
404,800	,,	Aug. 9	3½	3½%	Do. 3½ p.c. Deb. Red.	84—86	76—78	75—77
235,242	,,	,,	6¼	6¼%	Lea Bridge Ord. 5 p.c.	119—121	95—100	...
2,493,903	,,	Feb. 26	10	37/6	Liverpool 5 p.c. Ord.	..	..	...
600,000	,,	Mar. 22	—	7%	,, 7 p.c. Pref.	..	106—109	...
165,736	,,	Aug. 23	7/5/6	90/-	Maidstone 5 p.c.	..	104—109*	...
63,480	,,	June 28	—	3%	Do. 3 p.c. Deb	..	52—57	...
75,000	5	June 14	6	3/6	Malta & Mediterranean Met. of Melbourne — 4½ p.c. Deb.	4⅛—4¼	3¾—4	...
100,000	100	Apl. 5	4½	4½%	Montevideo, Ltd.	99—101	97—100	...
541,920	Stk.	May 17	4	4%	Newcastle & Gatsh'de Con.	11¼—12	50—55	...
1,875,892	,,	July 26	4¼	4¼%	Do. 4 p.c. Pref. Stk.	98½—99½	84⅛—85⅛	84⅛
250,166	,,	Aug. 9	—	4%	Do. 3½ p.c. Deb.	..	74—76	...
529,705	,,	June 28	3½	3½%	North Middlesex 10 p.c.	82—83	71—73	...
15,000	10	Aug. 23	—	7/6	,, ,, 7 p.c.	..	11⅛—12⅛*	...
55,940	10	Mar. 8	7/14/0	7/8⅜	Oriental, Ltd.	14—15	12—13	...
500,000	Stk.	May 3	8	8%	Plym'th & Stonh'se 5 p.c.	117—122	97—102	...
188,120	Stk.	June 28	—	78/9	Portsea Island, B	..	106—110	...
60,000	50	Mar. 8	13	65/-	Do. C	128—131	103—108	...
100,000	50	,,	12	60/-	Primitiva Ord.	118—121	100—105	...
290,069	5	—	8	—	Do. 5 p.c. Pref.	5⅛—6	⅛—¼	6/9
499,960	5	—	5	—	Do. 4 p.c. Deb.	4⅛—5	1⅛—2	30/-31/-
321,600	100	June 1	4	4%	Do. ,, ,, 1911	91—93	73—75	...
600,000	Stk.	July 26	4	4%	River Plate 4 p.c. Deb.	..	56—59	...
346,198	,,	June 28	4	4%	San Paulo — 6 p.c. Pref.	85—87	56—59	...
150,000	10	Mar. 22	6	6%	San Paulo — 5 p.c. Deb.	10⅛—11	5⅛—6⅛	...
125,000	50	July 2	5	5%	Sheffield A	47—49	38—41	...
135,000	Stk.	Aug. 23	10	5%	Do. B	223—224	103—105*	...
209,984	,,	,,	10	5%	Do. C	222—224	102—104*	...
327,300	,,	,,	10	5%	Shrewsbury 5 p.c.	220—222	102—104*	...
133,201	Stk.	Sept. 15	4	4%	South African	..	..	...
90,000	10	May 31	9	9%	South Met. Ord.	10½—11⅛	7⅛—9⅛	7⅛—7⅝
6,609,895	Stk.	July 26	5/4/0	50/-	Do. Red. Pref.	111—113	96—99	97—98⅛
250,000	,,	July 12	—	5%	Do. 3 p.c. Deb.	..	98—100	...
1,895,445	,,	,,	3	3%	Do. 6½ p.c. Deb.	72⅛—74⅛	61—63	62⅜
734,000	,,	Mar. 8	—	6½%	South Shields Con. Stk.	..	107—109	108⅛—108⅞
91,500	,,	Aug. 23	8½	4¼%	S'th Suburb'n Ord. 5 p.c.	157—159	126—128*	...
1,087,795	,,	,,	6	6%	Do. 5 p.c. Deb. Stk.	114—116	100—103*	...
368,837	,,	June 28	5	5%	S'th'mpt'n Ord. 5 p.c. max.	116—118	95—100	...
647,740	,,	May 3	5	7%	Do. 4 p.c. Deb. Stk.	99—102	88—91	...
121,275	,,	June 28	4	4%	Swansea 7 p.c. Pref. Stk.	..	72—77	...
250,000	,,	Aug. 23	—	70/-	Do. 6½ p.c. Deb. Stk.	..	101—103*	...
200,000	,,	June 28	—	6¾%	Tottenham — A 5 p.c.	..	105—107	...
120,000	,,	July 26	6	6%	Tottenham — B 3½ p.c.	135—138	120—125	...
782,275	,,	,,	6	6⅛%	District — 4 p.c. Deb.	115—117	100—105	101—103
181,255	,,	June 14	4	4%	Tynemouth 5 p.c. max.	87—89	78—83	...
258,251	Stk.	Aug. 23	5	2½%	Wandsworth, Wimbledon, and Epsom — Wandsworth A 5 p.c.	108½—109	88—90*	...
30,000	,,	July 12	8½	90/-	Do. B 3½ p.c.	151—156	126—131	...
255,636	,,	,,	6½	75/-	Do. C.	129—134	112—117	...
108,075	,,	,,	—	63/-	New Ordinary	..	97—102	...
140,865	,,	,,	—	63/-	Wimbledon 5 p.c.	..	97—102	...
352,000	,,	,,	6½	71/3	Epsom 5 p.c.	117—122	109—114	112½—113½
98,000	,,	,,	6½	76/3	3 p.c Deb. Stk.	131—136	112—117	...
88,416	,,	June 28	3	3%		66—69	57—60	...

* Ex. div.

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THE FLOW OF GASES and PROPORTIONING GAS MAINS.

By

F. SOUTHWELL CRIPPS, Assoc.M.Inst.C.E.

WALTER KING, Ltd., "Gas Journal" Offices, No. 11, Bolt Court, Fleet Street. E.C.4.

Theft of Gas Coal.—Before Messrs. M. Edwards (in the chair) and T. J. Wren, at Camborne, Norman Stanley Sheers (labourer), William Henry Bartle (labourer), and Thomas Roach (miner) were charged with stealing 1 ton 6¾ cwt. of gas coal, the property of the Camborne Gas Company, Ltd., from North Roskear Railway Siding, between July 29 and Aug. 18. Sheers was sent to prison for two months with hard labour, and Bartle for one month; while Roach was fined £1.

Birmingham Gas Department's Show.—Over one hundred collections of flowers, vegetables, and fruit were brought together at the first annual horticultural show of the Birmingham Corporation Gas-fitters' and Inspectors' Social and Recreation Society, held last Saturday at the Council House. In spite of the unfavourable conditions with which gardeners generally have had to contend, the displays, particularly in the vegetable section, were of a meritorious description, and evoked the unanimous praise of the judges.

Results at Darwen.—In his annual report on the finance of the Darwen Corporation, the Borough Treasurer states that the gas-works had felt heavily the fall in the consumption of gas compared with the pre-war year, 1914. In that year the consumption was 216 321,000 c.ft., and in 1923 it was 202,386,000 c.ft. Some of the decrease was due to less gas being used for street-lighting purposes; the controllers fixed to the street lamps having effected a large saving. Though the price of gas had been reduced during the year by 6d. per 1000 c.ft., the net profit was £4183.

Wolverhampton Gas Company.—The report of the Wolverhampton Gas Company states that there is a net profit for the half-year ended June 30, after payment of interest on debenture stock, of £24,813, *plus* £43 213 brought forward. The Directors recommend dividends for the half-year of 3 p.ct. on the preference stock, 5 p.ct. on the consolidated stock, and 3 p.ct. on the new ordinary stock, all less income-tax. They also recommend that £356 (interest for the half-year) be credited to reserve, £2000 of profits placed to reserve, and £10,000 to suspense account towards meeting the cost of replacement of plant and retorts immediately necessary, leaving £48,827 to be carried forward.

Coke-Oven Gas for East Kent.—Details of the proposals for the distribution at high pressure of coke-oven gas over a large area in East Kent were given in the "JOURNAL" for Aug. 16, 1922. This scheme, which was put forward by Messrs. Drew-Bear, Perks, & Co., Ltd., of the Battersea Steel Works, Wellington Road, S.W., was for the purchase of coke-oven gas from collieries in Kent, and its high-pressure distribution to rural districts which would otherwise be unable to obtain a supply. Under section 10 of the Gas Regulation Act, a Special Order was made authorizing this supply. The East Kent Gas Company, Ltd., have now been registered with a nominal capital of £100,000 in £1 shares, to acquire from Drew-Bear, Perks, & Co., Ltd., all the powers conferred by this Special Order. The first Directors are: Mr. E. A. Mitchell, of No. 30, Grosvenor Place, S.W. 1 (Consulting Engineer), and Mr. E. H. Perks, of No. 42, Park Lane, W. (a Director of Drew-Bear, Perks, & Co., Ltd.). The Secretary is Mr. G. F. McGrath; and the registered office is at No. 30, Grosvenor Place, S.W. 1.

Gasworkers' Strike in Paris.—A general strike was called last Friday by the Gasworkers' Union in Paris, in consequence of their demand for increased wages having been refused. Though it does not seem likely that the strike will attain the dimensions or completeness aimed at by the Communists, a good proportion of the men—8000 according to the Union report—are idle; and it is proclaimed by the Union that the ranks of these men will be greatly increased. The Paris Correspondent of the "Daily Telegraph" states that the chief theme of the speeches at a meeting held this week was insufficiency of wages, and the indifference of municipal and other authorities to the welfare of the workers. The Gas Company have put into operation the measures adopted with success during the strike of 1920; and the production of gas on the second day of the strike was maintained at its normal level in four of the bigger works. The Company appear to have been well prepared for the present dislocation, and Parisian users of gas are assured that the measures taken to combat the strike will be effective.

Grantham Gas Company.—The ordinary half-yearly meeting of the Company was held on Tuesday last—Mr. J. G. Thompson (Chairman) presiding. The report showed a profit on the half-year's working of £3406, out of which the Directors had transferred £1000 to the reserve fund. They recommended the payment of the statutory dividend of 5 p.ct. on the consolidated stock, less income-tax, amounting to £1525, and the carrying-forward of the balance to the next half-year's account. The Directors further announced that as from the September meter readings the price of gas would be reduced by ¼d. per therm, equal to 2d. per 1000 c.ft. The Chairman, in moving the adoption of the report, mentioned that in 1914 they had £9800 in the reserve fund. The account was now £4000. In 1914 the cash in the bank amounted to £5108. They now owed the bank £2449. The capital account balance in 1914 stood at £6197, and now they were owing £565 on this account. They were, he said, at last paying their way and also meeting their consumers in a liberal spirit. They must, however, be careful, because in the near future it would be necessary to reconstruct the carbonizing plant.

The price of gas for household and industrial purposes has been reduced in Dysart by 5d. per 1000 c.ft.

The lighting of Lisburn, Co. Antrim, for the period from Sept. 1 next to April 30, 1924, will be £900. There are 279 burners.

In the hope that a saving of £229 will be effected in the lighting season by the employment of automatic controllers, the Audley Urban District Council have decided to instal the Horstman gearsystem of automatic gas control. At the same meeting of the Council there were also discussed certain recommended improvements to the plant at the gas-works.

Pickering (Yorkshire) rates have advanced by 2d. in the pound, chiefly in order to meet the cost of renewed full street lighting, which has been only at half the normal since the war. A Special Committee of the Council have been considering the idea of a public electric lighting scheme, but have concluded that the cost is likely to be too great, and the demand too little.

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